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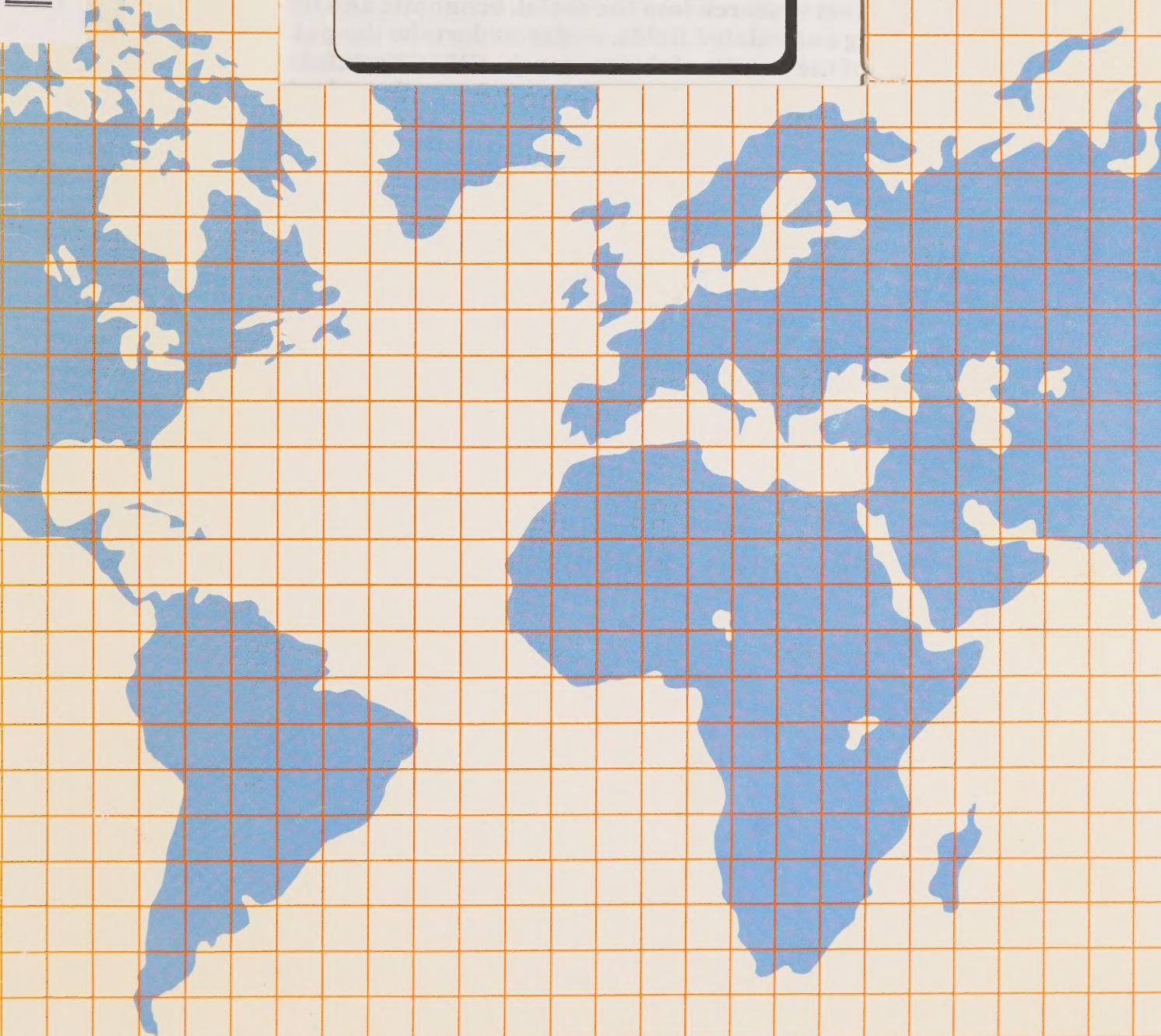
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***THE ECOLOGICAL CITY:
CANADA'S OVERVIEW***





THE ECOLOGICAL CITY: CANADA'S OVERVIEW

This report was prepared by
the Federation of Canadian Municipalities
for
Canada Mortgage and Housing Corporation

It was provided as Canada's contribution to
the Project Group on the Ecological Cities of
the Group for Urban Affairs of
the Organization for Economic Co-operation and Development

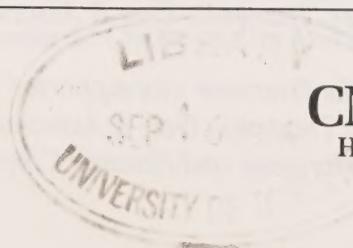
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EXECUTIVE SUMMARY

In December, 1992 the Organization for Economic Co-operation and Development's (OECD) Group on Urban Affairs, after having approved a number of sectoral studies on urban policy, approved the Project Group on the Ecological Cities. Its purpose is to help OECD member countries identify innovative integrated strategies to address the growing pressures on the economic, social and environmental conditions with their urban regions. Canada's representative on the Group on Urban Affairs, Canada Mortgage and Housing Corporation (CMHC) contracted the Federation of Canadian Municipalities (FCM) to develop The Ecological City: Canada's Overview. The Overview highlights the importance of the sustainability of urban regions in achieving national and global sustainability and is intended to act as a resource document in Canada and abroad.

The Overview consists of a description of the major characteristics inherent in the ideal of an ecological city and an overview of the domestic factors which influence urban development in Canada, such as government finances, geography and demographics. These include areas such as energy consumption, land use, transportation, water and wastewater treatment, housing, and urban crime. Selected innovative developments are highlighted through the document. Data on municipal programs and policies across a number of areas such as energy efficiency and intensification has been included from the Canadian Urban Research on the Environment (CURE) database information project.

In order to provide assistance to those policy makers who are actively promoting urban sustainability the Overview identifies some of the fundamental or root challenges to establishing ecological cities in Canada. Key issues explored include social values, education, public participation, institutional structures, financial and economic challenges. As well, seven innovative policy tools which may be utilized to help overcome many of the challenges identified are described in detail. Included among these are Strategic Planning Approaches, State-of-the-Environment Reporting, the Ecological Footprint/Appropriate Carrying Capacity Concept, Ecosystem-based Planning, Consensus Decision-Making and Municipal Environmental Assessments.

The focus of the Project Group on the Ecological Cities is on integrated approaches to the development and implementation of sustainability. The Overview contains a description of the existing institutional structures, with emphasis on the important influence exerted by federal departments and agencies whose activities are often overlooked in their impact upon urban sustainability. Integrative institutions such as the Waterfront Regeneration Trust, Projet de Société, the Fraser Basin Management Board, Conservation Authorities and Round Tables are highlighted to illustrate different approaches to institutional frameworks in support of integration. A contact list for Canadian Round Tables and Healthy Communities, as well as a listing of

resource documents, have been included in Appendices I and II.

A wide range of activities in support of urban sustainability have emerged in recent years across Canada. Yet for the most part, existing patterns of urban development in Canada remain unsustainable, in that they continue to increase the demands we place on the limited carrying capacities of our local, regional and global ecosystems. Recent and projected trends in land use, transportation, water use and energy consumption promise to continue to increase urban Canadians per capita consumption of the earth's limited natural resources. A continuation of these disturbing trends not only promises to reduce the capacity of future policy makers to make progress toward sustainability, but will lead to a declining quality of life well into the 21st Century.

If significant progress is to be made, fundamental obstacles to sustainability must be recognized and addressed by all orders of government and, most importantly by Canadian society in general. The Overview contains references to resource documents, case studies, and practical and theoretical policy tools which should help to further focus our efforts toward implementing measures in support of the long term goal of establishing ecological cities.

Résumé pour la direction

En décembre 1992, le Groupe des affaires urbaines de l'Organisation de coopération et de développement économiques (OCDE) a approuvé le Projet sur la ville écologique, après avoir fait plusieurs études sectorielles sur les politiques d'urbanisme. Son but était d'aider les pays membres de l'OCDE à relever des stratégies novatrices intégrées pour venir à bout des pressions croissantes qui s'exercent sur les conditions économiques, sociales et environnementales dans leurs régions urbaines. La Société canadienne d'hypothèques et de logement (SCHL) a signé un contrat avec la Fédération canadienne des municipalités (FCM) pour l'élaboration de Canada's National Overview of the Status, Challenges and Opportunities in Developing Urban Sustainability. Cet aperçu national fait ressortir la mesure dans laquelle le développement durable des régions urbaines est important pour parvenir au développement durable national et mondial et il est destiné à servir de document d'information pour les personnes intéressées au Canada et à l'étranger.

L'aperçu national est une description des principales caractéristiques inhérentes à l'idéal de la ville écologique et une vue d'ensemble des facteurs intérieurs qui influent sur le développement urbain au Canada, comme les finances publiques, la géographie et les caractéristiques démographiques. Il relève les tendances nationales d'un large éventail d'indicateurs du développement urbain durable. Ces indicateurs comprennent la consommation d'énergie, l'utilisation des sols, les transports, l'épuration de l'eau et le traitement des eaux usées, le logement et la criminalité en milieu urbain. Certaines initiatives novatrices sont mises en lumière dans tout le document. Ce dernier comprend aussi des données sur les politiques et programmes municipaux dans un certain nombre de domaines comme l'efficacité énergétique et la densification, qui ont été tirées de la base de données Canada Urbain : Recherche Environnement (CURE).

Afin d'aider les décideurs qui favorisent activement le développement urbain durable, l'aperçu national relève quelques-uns des obstacles fondamentaux à l'établissement de villes écologiques au Canada. Les questions clés examinées comprennent les valeurs sociales, l'éducation, la participation du public, les structures institutionnelles et les défis financiers et économiques. En outre, sept outils de politique novateurs qui pourraient être utilisés pour aider à surmonter un grand nombre des difficultés relevées sont décrits en détail. Ces outils comprennent les méthodes de planification stratégique, les rapports sur l'état de l'environnement, le concept de l'empreinte écologique ou de la capacité limite usurpée, la planification basée sur les écosystèmes, la prise de décisions par consensus et les évaluations environnementales municipales.

Le Projet sur la ville écologique est axé sur les méthodes intégrées de mise en oeuvre du développement durable. L'aperçu national contient une description des structures institutionnelles existantes et met l'accent sur l'influence importante qu'exercent les ministères et organismes fédéraux dont on oublie souvent les activités qui ont un impact sur le développement urbain durable. Le document présente certaines institutions d'intégration, comme la Fiducie de régénération du secteur riverain, le Projet de Société, le Fraser Basin Management Board, les offices de protection de la nature et les tables rondes, pour illustrer différents cadres institutionnels à l'appui de l'intégration. Une liste des personnes-ressources des tables rondes et des membres du Réseau canadien des communautés en santé ainsi qu'une liste de documents d'information sont présentées dans les annexes I et II.

Un large éventail d'activités qui appuient le développement urbain durable ont vu le jour ces dernières années au Canada. Pourtant, les modes existants de développement urbain au Canada demeurent en grande partie non viables, en ce sens qu'ils continuent d'accroître la charge que nous imposons aux capacités limites de nos écosystèmes locaux, régionaux et mondiaux. Les tendances récentes et prévues de l'utilisation des terrains, des transports et de la consommation d'eau et d'énergie indiquent que la consommation par habitant urbain des ressources naturelles limitées de la Terre continuera d'augmenter au Canada. Le maintien de ces tendances inquiétantes promettent non seulement de réduire la capacité des décideurs futurs de progresser vers le développement durable, mais aussi d'entraîner une baisse de la qualité de vie pendant une bonne partie du XXI^e siècle.

Si l'on veut faire des progrès importants, il faudra que tous les niveaux de gouvernement et, d'une plus grande importance encore, que la société canadienne en général reconnaisse les obstacles fondamentaux au développement durable et s'applique à les surmonter. L'aperçu national renvoie à des documents d'information, à des études de cas et à des outils de politique pratiques et théoriques qui devraient nous aider à axer davantage nos efforts sur la mise en oeuvre de mesures susceptibles d'appuyer le but à long terme qui consiste à créer des cités écologiques.

"When we talk about the environment and the world's need to safeguard it, most people immediately think of the rain forests or the globe's oceans. But there is an environment much closer to us that we also need to understand and to be concerned about - the urban environment."

Marianne Stenbaek, Chairperson, 5th International Winter Cities Biennial, Montreal, 1992.

1 INTRODUCTION: URBAN SUSTAINABILITY AND THE PROJECT GROUP ON THE ECOLOGICAL CITIES

Cities have flourished and perished for thousands of years, evolving in a myriad of different forms in response to such factors as local geography, climate, trade, conflict, and social patterns. Advances in technology, particularly involving transportation and heating, have significantly contributed to changes in the form and function of cities over the last two centuries. With the improved standards of living offered by these new settlements has come increasing population pressures, which are also contributing to rapid changes in our urban regions. For the first time in the history of civilization, roughly half the world's population and 80 per cent of the population in the Organization for Economic Co-operation and Development's (OECD) member countries, will live in urban regions by the year 2000.

Over the last half-century the environmental community has focused most of its attention on protecting wilderness areas that lie far from the unsustainable development of urban regions. Nature and the city were often considered to be antithetical, with the latter being unworthy of our attention and frequently subjected to outright neglect. Within the last five years however, it has been increasingly recognized that global environmental challenges, such as climate change, ozone depletion, land, water and air pollution, and resource depletion are all inextricably linked to the form and function of our expanding urban regions. The large quantity of pollutants generated within urban regions places growing stress on the global ecosystem - the ecosphere. Furthermore, urban regions are the primary markets which fuel resource exploitation, even in remote areas of the world. The combined effects of these developments on a global scale seriously threaten to undermine the quality of life for current and future generations in the developed world and already pose tremendous challenges for developing nations.

In order to make substantial progress toward sustainable development, we must begin to re-focus much of our efforts on the form and function of urban settlements - to literally bring sustainable development home to all facets of our urbanized lifestyles. It is at the individual and community levels of decision-making where sustainability concepts and theories must be transformed into meaningful practice. Michael Keating of the Centre for Our Common Future recognized this in *The Earth Summit's Agenda for Change* when he wrote that "many of the problems and solutions listed in Agenda 21 have their roots in local activities, so local authorities have a key

role to play in making sustainable development happen" (Keating, 1993).

In December, 1992, the OECD's Group on Affairs, after having conducted a number of sectoral studies on urban policy, approved the Project Group on the Ecological Cities. Its purpose is to help its member countries identify integrated strategies to address the growing pressures on the economic, social and environmental conditions within their urban regions. Canada's representative on the Group on Urban Affairs, Canada Mortgage and Housing Corporation (CMHC) has contracted the Federation of Canadian Municipalities (FCM) to represent it on the Project Group on the Ecological Cities and to prepare the Overview, given that FCM is the national voice of local government in Canada. The Overview has been developed with the participation of individuals from across Canada representing a variety of disciplines and organizations. The methodology used in its development and the participants are listed in Appendix I.

Currently, a wide gulf exists between the existing patterns of Canada's urban regions and the ecological city - a problem shared by all developed nations. *Existing patterns of urban development in Canada are unsustainable, and most of the current trends suggest that little progress towards urban sustainability is being made.* These trends not only further undermine the natural capital of the local, regional and global ecosystems, but also reduce the capacity of future policy makers to make significant progress toward sustainability. While progress has been made in many areas which are relatively easy to change, for the most part, fundamental challenges to urban sustainability remain firmly entrenched.

Fundamental challenges to urban sustainability must be addressed in a co-ordinated manner by all three orders of government, the private sector, academia and non-governmental organizations. In many cases, international co-operation will also be critical in implementing changes. The Project Group on the Ecological Cities is intended to encourage the adoption of strategies which reflect the integrated nature of the challenges of developing urban sustainability through domestic and international information exchange. The Project Group on the Ecological Cities is also intended to raise the level of domestic and international awareness of the need to promote progress toward ecological cities. The broad objectives of the National Overview are:

- To further define the ecological city in the Canadian context and examine indicators which demonstrate the status of urban sustainability in Canada.
- To highlight Canada's unique challenges and opportunities in developing urban sustainability and promote an understanding of the importance of integrated urban environmental strategies.

- To examine the nature of the Canadian institutional system and highlight institutional mechanisms which promote an integrated approach to developing sustainability.
- To highlight examples of innovative policy tools and approaches to assist efforts to establish policies and programs which promote urban sustainability.

The Overview should serve as a resource document to individuals concerned with urban affairs and with promoting urban sustainability. Appendix IV contains a listing of additional resources for those wishing to pursue subjects covered in more detail. The Overview is structured as follows:

- Section 2 identifies the significant domestic factors which set the broad context for urban policy and currently impact on Canada's urban regions. The implications of trends in areas such as demographics, immigration and migration, and government finances, are discussed.
- Section 3 examines the status of urban sustainability trends in Canada across areas such as land-use, urban transportation, energy consumption, water and waste water treatment, storm water, air quality, natural spaces, gender issues, housing, child poverty, urban crime and health. Innovative programs and policies are identified, with a focus on municipal governments, and include information from the *Canadian Urban Research and the Environment* (CURE) database information project which was launched by FCM in July, 1993.
- Section 4 focuses on some of the fundamental challenges to establishing ecological cities. Key issues are identified and explored in areas such as social values, education, government finances and institutional structures.
- Section 5 highlights a number of innovative policy tools. The value and relevance of Strategic Planning, the Ecological Footprint/Appropriated Carrying Capacity (EF\ACC) concept, State-of-Institution Reporting, State-of-Environment Reporting, Ecosystem-based Planning, Municipal Environmental Evaluations, and Consensus-based Decision-making are presented in some detail.
- Section 6 looks at Canada's governmental and non-governmental institutional structures and their relative roles and responsibilities in urban policy development and implementation, with emphasis on the current roles and responsibilities of federal departments and agencies.

- Section 7 contains an outline of the activities of existing integrative institutions such as the Fraser Basin Management Board, Round Tables, the Waterfront Regeneration Trust and Projet de Société.

The challenge of ecological cities is a formidable one which requires that we focus more attention on implementing measures to promote urban sustainability. Making substantive progress also requires that we begin to address the fundamental challenges to urban sustainability, many of which lie in society's values and beliefs. Foremost among these is the widespread notion that humans are somehow separate and independent from nature. This idea is opposite to the values, beliefs and behaviour of indigenous peoples in Canada and around the world. Recognizing and accounting for the interrelationship between urban social, economic and physical structures and the local, regional and global ecosystems is a critical element in making progress toward the development of ecological cities.

"A city in harmony with nature is still a futuristic vision, but it is not a pipe dream. Everything necessary to create these cities of the future is now within our capabilities; most of the concepts have been tested in Canada or elsewhere."

State of Canada's Environment Report, 1991.

1.1 Towards A Definition of an Ecological City/Region

An ecological city or region is a futuristic and relatively radical concept. It may be defined as an urban region or centre which does not erode the natural capital (air, water, land, renewable and non-renewable resources) of the earth, and whose structure and function result in a harmonious relationship with the local, regional and global ecosystems. Ideally, an urban region which stands in a harmonious relation with the natural environment would consume biological and physical resources at a rate which does not undermine the capacity of these resources to naturally replenish (in the case of non-renewable resources, to replenish through technological substitution, wherever possible). Ecological cities are also characterized by the strength, health and vitality of their communities and economies. Developing urban sustainability may be defined as the iterative process by which we improve our capacity to progress toward the ideal of the ecological city.

Fundamental to the ecological city is the widespread recognition that all human systems (social, political, cultural, and economic) are fundamentally dependent upon the natural support provided by the earth's various ecosystems. From an ecological perspective, a city may be seen as a node of production and consumption which impacts on local, regional and global ecosystems. Humans consume natural resources and energy, radically transform urban landscapes and habitats and emit pollutants and wastes while producing products and services, all of which have a profound effect on the surrounding and global ecosystems. Nature provides plants for human and livestock consumption and wood for shelter and paper products by converting solar energy, carbon dioxide and nutrients into usable plant matter through the process of photosynthesis. Photosynthesis provides the oxygen required by all animals for respiration. Ecosystems also absorb the wastes generated by human production and consumption, provide climate stability, protection from the sun's ultra-violet radiation and are a source of pleasure and enjoyment.

An ecosystem may be defined as a system of plants, animals and micro-organisms, together with the non-living components of their environment, which interact so that the flow of energy leads to a characteristic trophic structure and material cycles within the system. Ecosystems are self-sustained, independent, and complete entities in which resources are continuously reused and recycled. The area of an ecosystem can be small, encompassing only a pond, or large, covering an entire watershed such as the Great Lakes Drainage Basin. Social, cultural and economic systems within urban regions, while not ecosystems in and of themselves, are imbedded in the complex hierarchy of ecosystems which constitute the earth's ecosphere.

The ecosphere which houses our expanding population and economic system is incapable of growing, since it is constrained primarily by the availability of resources on the earth's surface and energy from the sun. The ecosphere's capacity to provide the biological resources which sustain human and other life forms is increasingly being undermined by growing human resource consumption. On a global level, Vitousek *et al* estimated in 1986, that resource consumption by humankind appropriated 40 per cent of the net primary biological production of land-based ecosystems; while Wackernagel *et al*, have recently calculated that if this appropriation were to increase at a *modest* level and sustained growth rate of 1.7 per cent annually, humankind would be appropriating all of the products produced through photosynthesis within 54 years (Wackernagel *et al.*, 1993). This consumption rate is not sustainable, since nature requires some "slack" to maintain essential life support systems. Ecologist Eugene Odum has estimated that one third of terrestrial ecosystems should be left in a wild or undeveloped configuration for biodiversity preservation (Vitousek 1986, Giampietro 1990 in Wackernagel *et al.*, 1993). This figure does not include the area required for additional absorptive capacity of the wastes being generated and other vital life support systems.

From a global perspective, a disproportionately large level of current human consumption is located in urban regions in developed countries. North American urban regions typically appropriate resources from well beyond their immediate territorial boundaries. One hundred thousand residents in the typical North American city import 200 tons of food, 1000 tons of fuel, and 62,000 tons of water each day, and generate 100,000 tons of garbage and 40,000 tons of human waste each year (Morris, 1990, in Roseland, 1992). Furthermore, urban regions in OECD countries typically consume 75 per cent of the total national energy consumption (OECD, ENV/US/EC(93)14). The impact of urban regions on the surrounding rural fringe or the 'urban shadow' extends the influence of urbanization well beyond its immediate borders to the surrounding countryside. Indeed, natural resources are appropriated, in the case of large urban regions, even from some of the remotest ecosystems on earth.

Despite many similarities in consumption patterns among the world's urban regions, there is no one model of an ecological city or urban region which is inherently superior. Ecological cities must reflect the distinctive opportunities and constraints, such as climate, topography, trading patterns, geology, water regimes, plant communities, and hazards, of their local and regional ecosystems. A policy or program that is successful in one urban region may not be readily transferable to another. In general terms, developing urban sustainability involves building flexibility into existing urban settlements and promoting and facilitating social and economic behaviour which minimizes the impact of urban dwellers on the local, regional and global ecosystems.

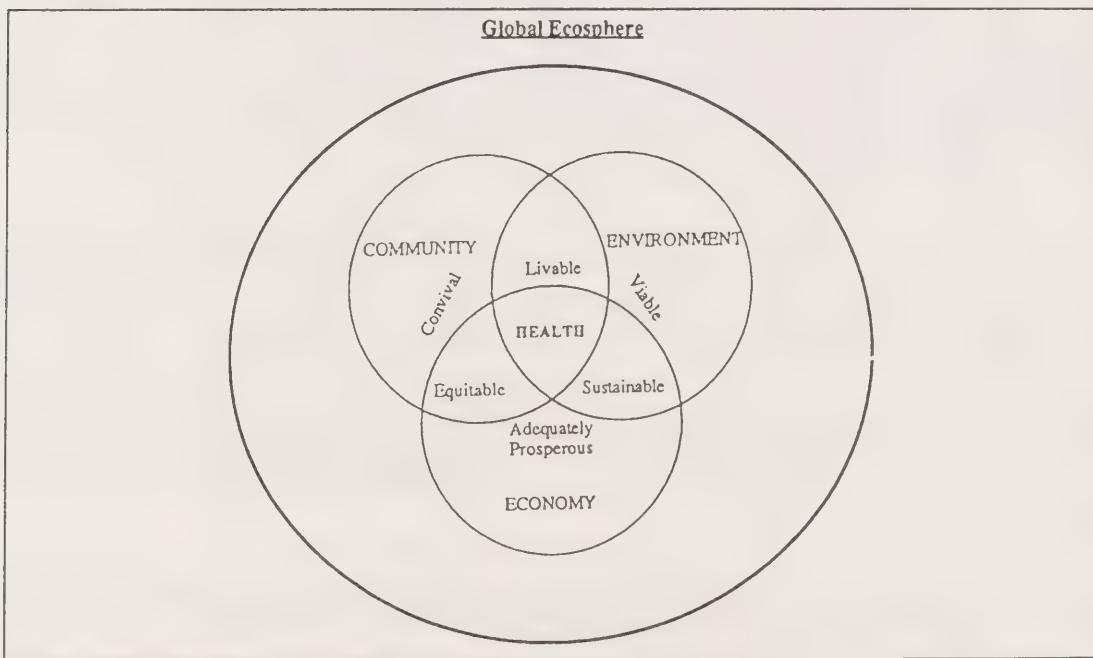
Given the size, growth rate and resource demands of many settlements, ecological cities may or may not be realizable, even with significant changes to the form and function of existing settlements. Yet, it is difficult to imagine, let alone predict, the types of opportunities and constraints facing Canada's urban regions in the distant future. The challenge for current policy makers is to identify integrative urban management strategies and policies that begin to increase the capacity of existing urban regions to become sustainable, given the current state of technology, economic, environmental and social trends, as well as the existing form and function of these settlements.

The ecological city may be compared to a three-legged stool, with the legs representing the environment, society and the economy respectively and with the community on top of the stool. In an ecological city, equal weight is placed on each leg of the stool in order to maintain balance. If one leg is neglected for a prolonged period of time, the stool will become unstable and eventually topple. In order to progress towards sustainability, more emphasis must be given to integrating the

environmental leg in order to begin to redress the historical imbalances favouring economy. Sustainability also requires that there be fundamental changes in how we organize our economic and social activities, rather than simply attempting to achieve balance between existing systems. Put another way, achieving balance between environment, economy and society in the ecological city requires fundamental transformations in the latter two elements.

The model represented in Figure 1 was adapted from the work of Dr. Trevor Hancock. It illustrates the relationship among the social, economic and environmental elements and the characteristics they must exhibit to create a healthy, sustainable city. These are: a regional and local environment that is viable (i.e., that supports human and non-human life), liveable and sustainable; an economy that is equitable, sustainable, and adequately prosperous; and a community that is liveable, equitable and convivial. These three interconnected domains within the urban region are firmly situated within, and fundamentally dependent on, the earth's ecosphere which is represented by the outer circle.

Figure 1: Healthy Community Model/Ecosphere



Source: Adapted from Royal Commission on the Future of the Toronto Waterfront, 1991.

Early sustainable development literature tended to focus on balancing the relationship between environment and economy rather than integrating them, and largely ignored the social sphere. Incorporating social planning into urban development by recognizing the important role of a community's social characteristics is critical to the success of developing ecological cities. Economic, environmental, and social sustainability are fundamentally interconnected, even though many of our values, beliefs and institutions either deny or fail to recognize this reality. Despite the impressive scientific and technological advances of the last century, our economic and social systems remain dependent upon the natural capital of the earth's ecosphere. In urban regions throughout the developed world there is a growing tension between current lifestyles and the growing recognition that, in order to preserve a quality of life for existing and future generations, we must rediscover ways of living fulfilling lives in a manner that reduces the extent to which we erode the carrying capacity of our local, regional, and global ecosystems.

The tension between predominant social and economic practices of modern industrialized societies and the 'ecological imperative' is further complicated by the fact that sustainability demands that we re-examine our social structures on a regional, national and international level. For the purposes of the Overview, social sustainability principles developed by the British Columbia Round Table on the Environment and the Economy have been incorporated into the working definition of an ecological city.

The social, economic and environmental legs which support the ecological city are in balance, not because of a series of difficult compromises between the increasing demands of our existing economic and social systems, but because these systems have become more fully integrated with the natural environment. Many of the characteristics which describe the ecological city below, reflect the nature of this integration. The following key principles and characteristics of an ecological city or urban region help to further define the concept in the Canadian context and may provide general policy direction for urban sustainability. Ecological cities may be said to:

- Make the maximum use of local and regional resources and minimize inputs such as agricultural products and manufactured consumer goods from more distant places, thereby increasing the vitality of the local and regional economies and the level of urban self-sufficiency.

- Promote an urban form that requires minimal inputs of energy and resources to build and sustain, with emphasis on the efficient use of energy, water, and materials, and the recovery of resources in the wastes produced as a by-product of their use and consumption.
- Enjoy the many benefits of significant community economic development which is focused on conserving local capital, small scale business development, maximizing human resource inputs, and minimizing energy and material resource inputs also known as dematerialization.
- Actively participate in the export of technology, expertise and financial resources to enable developing countries to improve the sustainability of their urban regions.
- Minimize waste, since most products are designed to be reused and recycled, through disassembly where possible. Closed-loop processes and industrial ecology/symbiosis will characterize highly efficient, small-scale industrial production within the ecological city.
- Make use of market mechanisms which reflect the full social and environmental costs (rather than simply the production, distribution and promotional costs) of goods and services through measures such as full cost accounting, full cost-pricing and product life-cycle analysis.
- Allow individuals to:
 - achieve and maintain personal physical, mental and psychological health;
 - feed themselves adequately and provide adequate and appropriate shelter for themselves;
 - have opportunities for gainful and meaningful employment;
 - improve their knowledge and understanding of the world around them;
 - find opportunities to express creativity and enjoy recreation in ways that satisfy spiritual and psychological needs;
 - express a sense of identity through heritage, art and culture;

- enjoy a sense of belonging and be assured of mutual social support from their community;
- enjoy freedom from discrimination and, for those who are physically-challenged, move about a barrier-free community;
- enjoy freedom from fear and security of person; and,
- participate actively in civic affairs.
- Be distinguished by the extent to which individuals are 'environmentally literate' and social values emphasize: community, quality over quantity, conservation/efficiency over consumption, sufficiency, spirituality and interdependence.
- Reflect institutional structures and policies supportive of healthy, safe and vibrant communities with ongoing grassroots stewardship of the natural areas in the region.
- Reflect considerably longer time horizons for major decision-making by political institutions, the private sector, non-governmental organizations and individuals.
- Reflect institutional systems based on natural boundaries such as watersheds which allow for the effective management of ecosystems and reinforce the interconnections between environment, society and economy.
- Reflect a physical shape and structure that works with, rather than against, existing natural features in a manner which increases the efficient use of material and energy resources, promotes biodiversity, and allows individuals the opportunity to experience and enjoy vibrant natural areas within close proximity of their communities.
- Develop in a manner that enables individuals to engage in routine behaviour that is ecologically responsible, cost-effective and convenient, rather than relying upon their altruism.
- Develop new policies and programs which continue to reflect the integrated nature of urban challenges to sustainability by fully considering their social, economic and environmental components.

An enormous amount of effort is currently being applied to improving the capacity of urban regions in Canada to become more sustainable. In several regions the process of promoting urban sustainability is well underway. The challenge is to identify the many interrelated factors which impact on Canada's urban regions and the fundamental impediments to change, and to identify short and long term urban management strategies that can be utilized by all orders of government and non-governmental organizations to improve the level of urban sustainability. In many cases, this will require new modes of thinking, new values, new decision-making processes and integrative strategies which cut across traditional institutional structures. Making significant and lasting progress toward the goal of establishing ecological cities will also require fundamental changes to a number of basic components of our current economic and social systems. Some changes will be easily attainable in the short term, while those that are more deeply rooted are likely to require considerable effort over a generation or more.

"Only by understanding the city as part of nature can we deal with the wounds inflicted on it, mend its ways and design its form so that it functions sustainably to satisfy needs without diminishing opportunities for future generations."

Royal Commission on the Future of the Toronto Waterfront, *Regeneration*, 1991.

1.2 An Ecological Approach to Urban Policy

In order to make significant progress toward establishing ecological cities, it is important to utilize new conceptual tools that reflect the numerous links between human-based systems and the local, regional and global ecosystems. Traditionally, institutional structures and policies have been established on a narrowly defined, compartmentalized basis, which fails to recognize the complex and integrated nature of the social, economic and environmental impact of urban form and function. Many new conceptual frameworks and analytical tools have been developed in Canada to address the challenge of ecological cities, a number of which are highlighted in Section 5. The "ecosystem approach" concept has been promoted and refined through the work of the Canada-US International Joint Commission over the past decade and through the more recent efforts of the Royal Commission on the Future of the Toronto Waterfront (RCFTW). The ecosystem approach, according to the RCFTW:

- Includes the whole system, not just parts of it.

- Focuses on the interrelationships among the elements.
- Understands that humans are part of nature, not separate from it.
- Recognizes the dynamic nature of the ecosystem, presenting a moving picture rather than a still photograph.
- Incorporates the concepts of carrying capacity, resilience, and sustainability - suggesting that there are limits to human activity.
- Uses a broad definition of environments - natural, physical, social and cultural.
- Encompasses both urban and rural activities.
- Is based on natural geographic units such as watersheds, rather than on political boundaries.
- Embraces all levels of activity - local, regional, national and international.
- Emphasizes the importance of species other than humans and of generations other than the present.
- Is based on an ethic in which progress is measured by the quality, well-being, integrity and dignity it accords natural, social and economic systems (*Crombie et al., Regeneration, 1991*).

These ecosystem concepts, combined with the principles and characteristics of the ecological city described in Section 1.1, provide the broad conceptual framework required for developing and establishing measures to promote urban sustainability and ecological cities in Canada. The application of these principles to current institutional structures and development trends allows one to comprehensively identify the fundamental challenges to establishing ecological cities. These principles also allow one to recognize that there are numerous opportunities for significant social and economic advantages to be exploited through the development and redevelopment of sustainable urban settlements in Canada.

"Sustainability recognizes that qualitative development - for example, creation of new technologies or processes for adding value to products - should continue, while quantitative development - for example, urban growth and sprawl, or resource extraction, must recognize the limits of ecosystems to regenerate raw materials and absorb wastes."

**British Columbia Round Table on the Environment and the Economy,
Strategic Directions For Community Sustainability, 1993.**

2 BACKGROUND: THE BROAD CONTEXT FOR URBAN POLICY

Canada's relatively small population in relation to its large and geography separates it from other developed nations. As such, it has a broad range of unique challenges, opportunities and experiences in its efforts to develop ecological cities. Canadians also share many of these challenges with other countries. This section describes the broad social, political, economic and institutional frameworks in Canada which help to establish the context within which efforts to establish ecological cities take place. A brief overview of the history of Canadian urbanization is provided.

2.1 Social and Political Context

The two founding European peoples of Canada, the French and English, represent the largest cultural groups in Canada. Most French speaking Canadians live in the province of Quebec where the English-speaking are a minority. English-speaking Canadians form a large majority in the remaining provinces. Approximately 1 million French-speaking people are located in Ontario and the rest live in different regions all across the country. The existence of two principal cultures and the dynamic nature of their relationship continues to exert an important influence on national policies and is one of the defining characteristics of the Canadian nation-state.

Canada is home to over 600 aboriginal communities representing a total aboriginal population of approximately 1 million. Native groups have been struggling for and gaining a greater share of control over their own communities and land. As a result, they have an increasingly important role in developing sustainability. Aboriginal peoples also have considerable knowledge about their local ecosystems and methods by which human activities can be integrated in a sustainable manner. Aboriginal cultures have traditionally embodied an ethic and value system which supports sustainable approaches to living. Given that the majority of aboriginal people now live in urban centres, the future emergence of aboriginal forms of self-government has many implications for existing municipal structures in some provinces. Aboriginal

self-government promises to have an increasing influence in such areas as housing, service delivery, accountability and jurisdiction, land-use planning and economic development.

Since the 1970's, the federal government has adopted an official policy of multi-culturalism. Canada accepts more than 200,000 immigrants from around the world annually. Most newly arrived ethnic groups have well-established communities in urban regions such as Vancouver, Toronto and Montreal. This steady influx of immigrants has important social and economic consequences for urban policies in these and other regions, which will be explored more fully, later in this section.

Canada is a democratic federation with a complex system of power sharing between three primary orders of government - national, provincial and regional/local. National and provincial elections are generally held every four years and representatives are elected according to a single member plurality system, rather than proportional representation. Municipal government election periods vary, but are generally held every three years. In some jurisdictions, municipal government representatives are appointed or elected-in-council.

Ten provincial governments form the second order of Canadian government along with three territorial governments which administer the large northern regions of the country. Provincial governments in Canada vary tremendously in terms of their size and population. The largest provinces, Ontario and Quebec, are located in central Canada and have a total land area of 2,619,260 square km and 1993 populations of 10.7 and 7.2 million respectively. The smallest two provinces, Nova Scotia and Prince Edward Island, have a combined area of 62,150 square km and populations of 923,000 and 131,600 respectively. In western Canada the largest provinces by population and land area are British Columbia with 947,800 square km and 3.5 million inhabitants and Alberta, with 661,190 square km and 2.6 million people.

Historical tensions between the federal and provincial governments continue to exist, particularly in regard to their relative jurisdictional responsibilities, which were not well-defined in the *British North America Act, 1867* and the *Constitution Act, 1982*. The provincial and federal governments share power in many areas through a number of multilateral and bilateral agreements. The division of powers has also come through judicial decisions from the Supreme Court of Canada.

Municipal governments exist at the discretion of their provincial/territorial governments which exercise complete jurisdiction over them. The structure and function of municipal government vary considerably by province. This is the result of different political, economic, cultural and historical factors among the provinces. In general, provincial/territorial governments tightly control the structure and responsibilities of municipal governments and regularly legislate changes to their numbers, boundaries and degree of authority.

Several provinces have created regional municipal governments (Tier 2) largely in response to the stresses associated with expanding urban centres after the Second World War. Tier 2 governments provide various services in their metropolitan areas and often perform regional planning for, and co-ordination among, local municipal governments (Tier 1).

The federal government exerts a direct and indirect influence on the ability of municipal governments to operate within their provincial mandates. The role of the federal government in urban affairs is examined more fully in Section 6.

"Population growth and migration to cities is a serious sustainability issue challenging most Canadian urban regions."

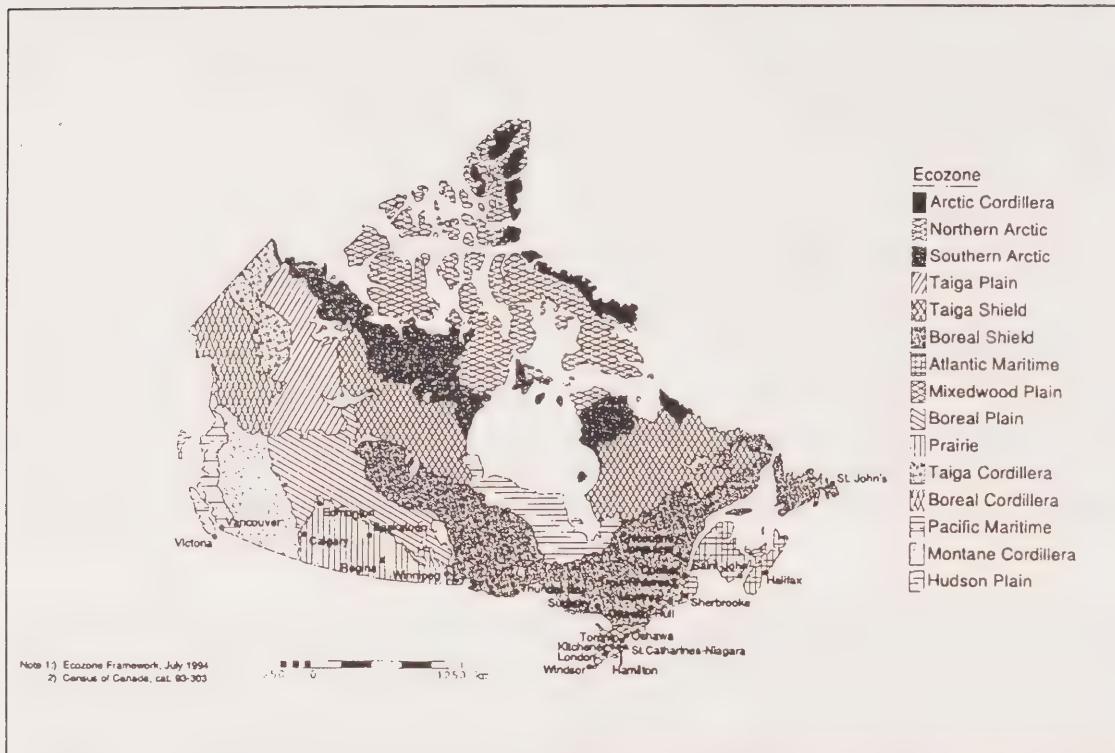
David Marshall, Fraser Basin Management Board, 1994.

2.2 Demographic and Geographic Context

With 28 million inhabitants covering over 13 million square kilometers of land and water, Canada is the largest country by land area and has the lowest population density in the world - 3/square km. Canada is a high-latitude country dominated by Arctic, Sub-Arctic, and Boreal ecosystems, with relatively short growing seasons and long, cold winters. Much of Canada is marginal for human habitation and only 45 per cent of the land is capable of supporting forests. Major population centres are concentrated close to the warmer U.S. border areas contained in the temperate forest belts of the east and west. Canada has 25 Census Metropolitan Areas (CMAs) - defined by Statistics Canada as having a core population of 100,000 people, including surrounding urban and rural areas that have a high degree of economic and social integration with the core. CMAs represent 61 per cent of Canada's population.

Canada's natural environment has been categorized through a comprehensive national classification system involving tiers of ecosystems. The many ecosystems within the classification system are delineated by a wide range of biological and physical elements and their borders cross over political boundaries. The fifteen largest terrestrial ecosystems and the 25 CMAs are represented in Figure 2.

Figure 2: Major Urban Areas of Canada: Terrestrial Ecozone Framework, 1994

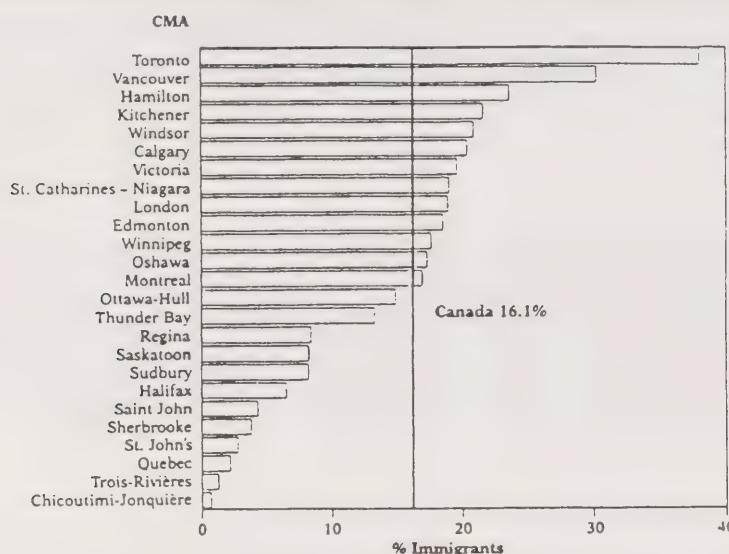


Source: Environment Canada, State of Environment Directorate, 1994.

These in turn may be broken down into 217 *ecoregions*, and over 1050 *ecodistricts*. Five marine *ecozone* and 11 *ecoprovince* classifications have been developed for Canada's surrounding ocean ecosystems. The primary objective of this classification system is to have an unbiased, universal system that may be applied to a variety of uses, such as resources management.

In 1992, Canada's population of 28.5 million was growing at a rate of 1.1 per cent annually due to a birth rate of 14.1 per thousand and immigration. Forty-seven per cent of Canada's population migrated between 1986 and 1991 and the net impact of this migration on CMAs was varied. For example, Vancouver, Ottawa-Hull, Victoria and Oshawa gained population primarily through migration while Toronto, Montreal, Winnipeg, Edmonton and Saskatoon lost population to migration, even though their total populations increased. Half of Canada's total immigrant population of 4.3 million has arrived since 1971. According to 1991 Census data, 94 per cent of recent immigrants live in Ontario, British Columbia, Alberta and Quebec, with 57 per cent residing in Canada's three largest metropolitan areas, Toronto, Montreal and Vancouver (Statistics Canada, no. 93-322). Figure 3 illustrates the percentage of immigrants settled in each of Canada's 25 CMAs.

Figure 3: Percentage Of Immigrants Settled in Census Metropolitan Areas in 1991



Source: *Statistics Canada* (no. 93-311E), 1993.

Migration and immigration patterns have significant consequences for urban areas. The concentration of immigrants in Canada's larger urban regions has important implications for urban policy in areas such as land-use planning, housing, transportation and social services. Recent immigrants, many of whom come from densely settled urban regions, also bring with them a diversity of cultural values and an overall perspective which contributes to the richness of Canadian culture. Cultural diversity has the potential to encourage the exchange of ideas and promote the evolution of more globally-oriented perspectives that can often involve important attitudes towards sustainability. For example, new Canadians coming from high-density settlements may be more supportive of intensification initiatives in Canadian urban centres where they now reside.

Another significant demographic trend is the aging of Canada's population. Since 1961, the shift in the age structure of Canadians has moved toward an increase in the proportion of older age groups (45 to 64 and 64 +). For example, according the *Statistics Canada's Population Dynamics in Canada* (Statistics Canada, no. 96-305E), the percentage of Canadians between the ages of 45 and 64 has increased from 17.4 per cent in 1961 to 19.7 per cent in 1991. Canada's seniors, those over the age of 64, now comprise a greater percentage of the population than ever before in Canadian history, having climbed from 7.6 per cent in 1961 to 11.6 per cent in 1991. The overall effect of immigration on the median age of Canada's population is negligible because immigration is spread among a wide variety of ages and the birth rate for recent immigrants is not significantly higher than among Canadians in general. An

increasing proportion of elderly within Canadian society in the decades to come will have important implications for public policy in areas such as housing, transportation, employment and a range of social and health services. For example, as Canada's population ages, the number of dwelling units will have to increase as average household sizes continue to fall.

"The budget is without a doubt the most important statement of environment policy that any government makes."

Jim MacNeil, Our Common Future, The World Commission on Environment and Development, 1987.

2.3 Economic and Fiscal Climate

Canada has now emerged from a prolonged recession which contributed greatly to the country's substantial debt problem. The national unemployment rate stood at 11.2 per cent during 1993, but varies considerably by region and age category. Total unemployment was 1.5 million in 1993 with part time employment accounting for over 17 per cent of the 12.3 million employed. Trends in the level and type of employment are important factors influencing progress towards the sustainability of urban regions. The levels of employment within urban regions have critical social consequences for the state of the community, as well as municipal government finances. Meaningful employment is fundamental to maintaining healthy communities and provides municipal governments and local businesses with their primary source of revenue. Employment opportunities also influence migration patterns between and within urban regions.

Since 1965, the share of manufacturing in the Gross Domestic Product (GDP) has declined from 22 to 17 per cent. The growth of Canada's service and high technology sectors has helped to compensate for the overall decline in manufacturing. The changing composition of the economy, particularly its shift from traditional manufacturing to service industries, has had an impact on urban form. As the traditional conceptual barrier between work/home continues to be eroded by increasing part time employment and 'telecommuting' in the service industries, the need to commute to the workplace will decrease somewhat. This trend also allows individuals to increase the distances from their homes and workplaces.

Canada's economy remains heavily dependent on trade, with almost half its 1991 GDP made up of trade in goods and services, primarily to the U.S. market. Most of Canada's exports remain primary goods. Canada had a 1991 deficit in high value-added goods of \$1.5 billion.

Canada's tax revenue as a percentage of GDP has been rising steadily from 31.6 per cent in 1981 to 37.3 per cent in 1991. A decade of rising taxes has significantly decreased the electorate's tolerance for additional taxes, but has not solved the problem of growing debt. Canada's total net public debt for 1993-94 represented \$722 billion or roughly \$25,127 *per capita*, exceeding the country's annual GDP. The federal government accounts for two-thirds of the country's total debt. In fiscal 1992-93, the federal government recorded a deficit of \$40.4 billion, with consolidated revenues and expenditures of \$121.5 billion and \$161.9 billion respectively.

Provincial governments share the serious fiscal challenges facing the national government, with most operating through deficit financing to varying degrees. While each province managed to cut its deficit in fiscal 1993-94, provincial deficits totalled \$19.5 billion. Provincial debt-servicing costs are expected to average 14.4 per cent of consolidated revenues in 1994-95, up from 10.2 per cent in 1989-90. The financial characteristics of the provinces vary significantly in terms of taxation, revenues, debt and deficits.

Five of the 10 provinces have announced plans to balance their budgets by 1996-97. Their progress will be heavily dependent upon spending restraint, which is sure to continue to impact upon municipal governments dependent, in large measure, on provincial financing. Regional and local municipal governments are not permitted to incur operating deficits, but may assume debt for the purpose of financing capital projects. Their level of financial resources is directly affected by the state of provincial and national finances. The federal government provides transfer payments to the provinces which, in turn, provide municipal governments with considerable financial support.

The public sector in Canada is also the source of considerable employment, with 745,000 people working directly for some order of government in 1991. Health, social services and education are dominated by the public sector and represent the three largest labour force groupings in Canada. They employed one in six or just over two million Canadians in 1991 (Statistics Canada, no. 93-326). Due to growing fiscal constraints, overall public sector employment has been declining recently, reversing a 30 year growth trend.

2.3.1 Impact of Economic and Fiscal Climate on Urban Sustainability

The fiscal constraints facing all orders of government in Canada have both positive and negative effects in terms of developing urban sustainability. Municipally, a reduction in revenues from government transfers and property taxes provides increasing financial pressures to eliminate existing municipal subsidies for government services such as water and waste water treatment and solid waste management. The elimination of subsidies in these areas would result in considerable environmental benefits through improved resource conservation and waste reduction, in addition to improving municipal finances. Some municipalities are currently developing and implementing user-fees for selected municipal services.

The application of other economic instruments for resource conservation and environmental protection is a trend which will likely be accelerated by growing fiscal constraints. Furthermore, the utilization of public-private partnerships by all orders of government for service delivery in areas such as water and waste water treatment, solid waste management and transportation infrastructure is also likely to increase. This trend is likely to result from the growing inability of governments to adequately meet enormous financial requirements for the maintenance, upgrading and development of urban infrastructure.

The need to reduce government operating expenditures may also provide important impetus for structural changes to governance institutions. This could lead to improvements in the institutional framework for sustainability by clarifying responsibilities and eliminating duplication of government services. Many existing opportunities for increasing government efficiencies through water and energy conservation may also be implemented more readily as a result of fiscal constraints.

On the negative side, financial constraints and increasing competition among municipal governments for scarce private investment, generally reinforce traditional economic development practices. Financial constraints may slow the implementation of progressive environmental policies, such as municipal environmental impact assessments for new developments or storm water management techniques, since there are implementation and management costs involved. Provincial resource constraints may also cause some provinces to delegate more environmental responsibility to municipal governments, without the required resources to ensure adequate service delivery. Finally, as a result of widespread measures to reduce or freeze public sector wages, many municipal governments may be unable to hire new environmental staff or fund new programs.

The fiscal constraints facing the federal and provincial governments have already, and will continue, to result in cutbacks to health and social programs. These measures are likely to have a negative impact on social sustainability which will vary regionally. In addition, the large extent to which Canadian governments, directly or indirectly, employ Canadians means that future deficit reduction measures involving staff reductions and program funding cuts promise to exert a significant impact on employment and the Canadian economy in general.

"As the Canadian population becomes increasingly concentrated in urban areas, it is simultaneously becoming less concentrated in those areas. In other words, our cities and towns are not just growing in population, but at the same time they are spreading out and changing their structure into a looser, more widespread urban pattern."

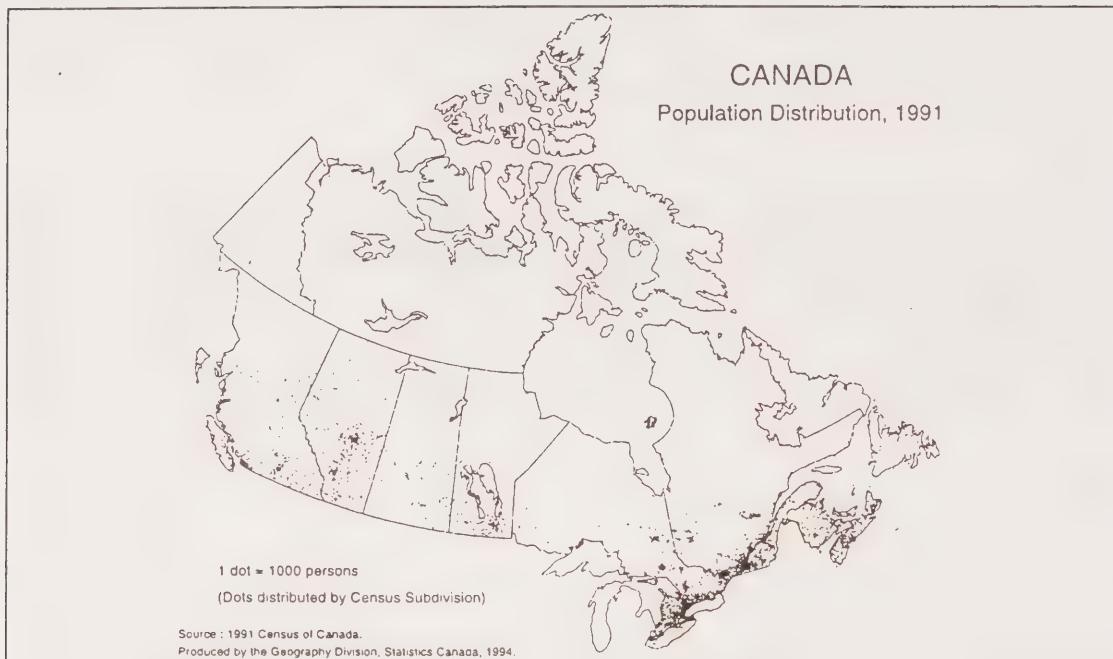
N. Richardson, *Sustainable Development and Land-Use Planning*, 1991.

2.4 History of Urbanization

Relative to European countries, Canada's transformation from a rural to an urban society has been rapid and its history as an urbanized nation, brief. Prior to 1924, Canada was a predominantly rural nation with most economic activity centred around agriculture or resource exploitation. The increased mechanization of these activities, the Depression, and the increased opportunities associated with industrialization located in urban centres greatly contributed to the gradual migration from rural to urban settlements prior to the Second World War. From 1941 to 1961, the population of urban Canada nearly doubled, rapidly increasing the number of urban centres with populations in excess of 100,000 and spawning the development of the Canadian metropolis. By 1965, more than 50 per cent of the population lived in urban centres of over 100,000. By 1972, over 50 per cent of Canadians lived within metropolitan regions or in suburban areas just outside of the core cities.

Figure 4 from the 1991 Census data, illustrates the pattern of population concentration in Canada.

Figure 4: Population Distribution in Canada, 1991



Source: Statistics Canada, Geography Division, 1994.

As Figure 4 demonstrates, population levels and the degree of urbanization in Canada vary considerably among provincial governments. The provinces with the highest levels of urbanization are Ontario, 81.8 per cent, Alberta, 80.4 per cent, British Columbia, 80.4 per cent and Quebec with 77.6 per cent. Only New Brunswick, 47.7 per cent, Prince Edward Island, 39.9 per cent, and the Northwest Territories, 39.9 per cent, remain predominately rural. The largest five CMAs account for 38 per cent of the population. The pattern of Canada's urban settlements may be described as two distinct urban systems. One extends across the country in a roughly linear series of cities spaced widely apart, each having its own economic base and functioning as the centre for a larger region. The second system is the 1000 km long Quebec City to Windsor corridor of urban development, extending from the Gulf of St. Lawrence to the western end of Lake Erie. It is home to half of the population of Canada and nine of the 15 largest cities.

"The current development patterns of Canadian cities are forcing us into consumption patterns that we cannot sustain. These developments are leading us into an 'infrastructure trap' from which it will be difficult and costly to escape."

Mathis Wackernagel, University of British Columbia's Task Force on Planning Healthy and Sustainable Communities, 1994.

3 THE STATUS OF CANADA'S PROGRESS TOWARD ECOLOGICAL CITIES

The following section provides an overview of progress toward urban sustainability in Canada, drawn from a wide variety of sources. While the process of promoting certain aspects of urban sustainability is well underway in many areas across Canada, formidable challenges remain. A number of these are highlighted in Section 4. The range of subjects described here is intended to present the reader with a sense of Canada's progress to date. While this section is not meant to fully describe the wide ranging and numerous developments underway in support of urban sustainability, it will give readers a broad picture of the national state of urban sustainability in Canada. As well, it will describe a number of innovative developments which contribute to promoting urban sustainability. Given the wide range of policies and programs, emphasis is given to the policies, plans and activities of Canada's municipal governments.

The examples of urban sustainability indicators contained in this section reflect a broad range of both the causes and effects of matters related to urban sustainability. The areas examined are intended to provide further evidence of the need for policy makers at all orders of government to recognize the integrated nature of environment, economy and society in their efforts to establish sustainable cities. The information compiled here strongly suggests that Canadians have yet to fully address the need to implement a broad range of policies that promote urban sustainability. While some trends are encouraging, the majority point to the fact that urban development in Canada, over the short term, will continue to erode the natural capital of our local and regional ecosystems, thereby contributing to the international challenge of establishing global sustainability. If the situation is not addressed, it will further erode our capacity to promote urban sustainability in the near future, and will continue to result in a declining quality of life for Canadian urban dwellers as we near the 21st century and beyond.

"Although the term 'high density' evokes images of towering apartment buildings and little open space, dense developments are pleasant and liveable, if planned well. A more compact urban form, far from precluding green spaces and structures on a human scale, can actually facilitate them."

Marcia Lowe, Alternatives to the Automobile: Transport for Liveable Cities, 1990.

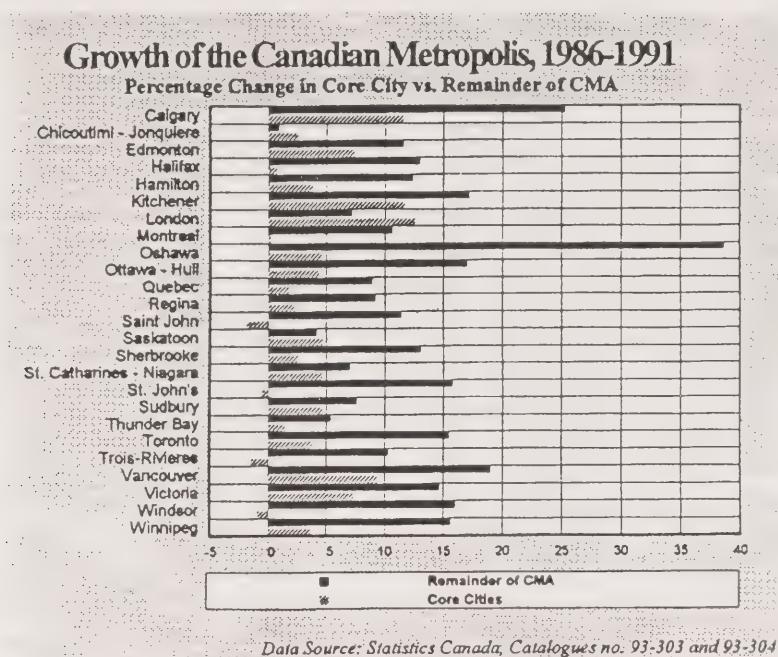
3.1 Land-Use Trends/Planning

The global importance of land-use is well illustrated by considering carbon dioxide production which is a key contributor to global climate change. Urban form, especially with respect to transportation, population, and employment densities, has a profound influence on levels of energy consumption. Residents of European cities tend to use less energy than their North American counterparts because they have a reduced need for travel and enjoy the advantages of public transit, and utilize district heating systems (Brugmann, Jessup, 1993). Residents in most Canadian urban regions annually produce 20 tons of carbon dioxide *per capita* each year. Many European urban dwellers produce only half that amount. Recent research at the International Institute for Applied Systems Analysis suggests that if North American cities modeled future development after cities like Amsterdam, Holland, future carbon dioxide emissions would only be half of the current predictions.

Since the Second World War, land-use patterns in Canadian urban development have largely been the result of the application of technologies built on two primary assumptions - the long term availability of inexpensive and abundant energy sources; and the limitless availability of land and water resources. This has led to the construction of spacious, energy inefficient homes and buildings and an urban form based on the widespread use of the private automobile for transportation. The increasing affordability of private automobiles contributed greatly to their expanded use over the latter half of this century. Rising levels of automobile use, combined with the 'green field' status of most sites for urban development, encouraged the proliferation of low-density, single family dwelling suburban settlements, often referred to as 'urban sprawl'. These trends were supported by increasing levels of affluence within Canada's urban populations.

Prior to 1981, the majority of core cities within metropolitan areas in Canada experienced a net increase in population growth. Figure 5 shows the growth patterns of major CMAs during the economic boom between 1986 and 1991. It illustrates a trend of declining populations in core cities and a rise in populations in surrounding, non-core areas.

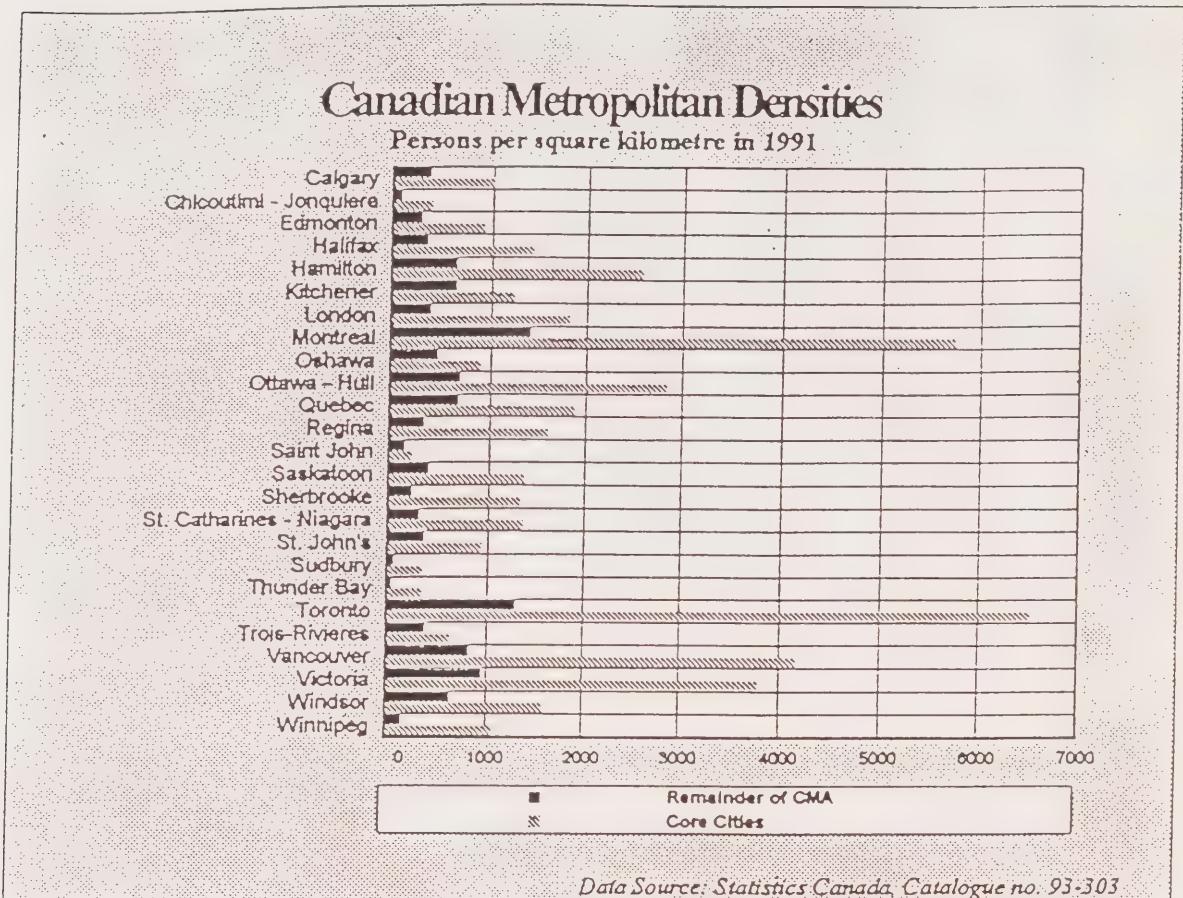
Figure 5: Population Change (1986-91): City Core vs. Remainder of Census Metropolitan Area



Source: Statistics Canada (no. 93-303), *Intensification Report, May 1993*. Canadian Urban Institute.

Figure 6 is also based on data from the 1991 Census, and illustrates population densities between core and non-core areas among the 25 CMAs. Together, Figures 5 and 6 demonstrate that most of the population growth in non-core metropolitan areas is low-density growth or urban sprawl. They also demonstrate that this development pattern is not confined to Canada's largest urban centres, but exists in a large majority of the country's metropolitan regions.

Figure 6: Population Density (1991): Core City vs. Remainder of Census Metropolitan Area



Source: Statistics Canada (no. 93-303), *Intensification Report, May 1993*. Canadian Urban Institute.

The intensity of low-density suburban land-use development has fallen off considerably during the last three years. Urban housing starts dropped from a high of 215,340 in 1987 to 129,988 in 1993. Low-density land-use patterns are the result of numerous social, economic and political factors, some of which vary on a provincial and regional basis. There are what may be referred to as 'pull' and 'push' factors supporting the development of low-density suburban areas over higher-density core areas. 'Pull' factors include matters such as the differential tax and subsidy treatment accorded to municipalities in the core and suburban areas favoring suburban housing and commercial settlements; the subsidization of suburban infrastructure and services by regional and provincial governments; and federal and provincial government subsidies on energy and through continued emphasis on road building which supports private automobile use. 'Push' factors include higher property taxes in core areas due to inequitable tax and subsidy treatment among municipal governments, reduced levels of services in core areas, and the perception of increasing levels of crime in core areas.

The overall impact of urban sprawl is the subject of continuing debate in Canada, much of which revolves on ideological rather than empirical evidence (Isin, Tomalty, 1993). A considerable amount of evidence has been accumulating internationally which demonstrates the increased ecological impact of low-density over high-density urban development. Those who promote intensification argue that urban sprawl is the most expensive land-use pattern in terms of its negative social, economic and ecological consequences. Urban sprawl is said to result in:

- The inefficient use of energy, primarily for transportation and space heating, with a resulting increase in the *per capita* production of air and water pollution.
- High *per capita* levels of carbon dioxide production which contribute to global climate change.
- Higher *per capita* water use and poorer recycling rates.
- Increasing pressures on undeveloped green space and prime agricultural lands.
- Social and economic costs associated with a low jobs-housing ratio, resulting in lengthy commuting and increasing levels of traffic congestion.
- Considerably higher infrastructure costs (water, sewers, schools) for municipal governments, due primarily to the greater distances required to service low-density development.

- Increasing demand for additional infrastructure support for private vehicles.
- Settlements with community infrastructure dependent upon automobile travel cause mobility difficulties for women, youth and the elderly.
- The erosion of the social and economic viability of more densely settled core areas within metropolitan regions including the economic viability of public transit networks.

Opponents of intensification within core urban areas believe that it results in increased crime and traffic, devaluation of property and a general loss in quality of life. Other detractors may be motivated by ideological concerns over state intervention or through vested commercial and bureaucratic interests related to the continuance of low-density suburban developments. Those who argue against efforts to control urban sprawl through government intervention generally counter the assertions made by advocates of intensification. Selected arguments in favour of allowing urban sprawl to continue include:

- Urban sprawl occurs because it is responding to the legitimate housing choices of residents.
- High-density mixed-use neighborhoods are less pleasant than low-density residential areas.
- Central cities are in decline for macro-economic reasons, with suburbanization as a symptom. Intensification will therefore fail to reverse this decline.
- Social goals cannot be achieved through land-use planning.
- The costs of public services are lower in low-density settlements.
- Intensification will not substantially reduce the amount of land used for development and therefore will not reduce service costs.
- The environmental benefits of high-density housing are exaggerated.
- Air quality is better in a dispersed settlement pattern and may be adversely affected by intensification.

Underlying anti-intensification arguments is the assumption that low-density suburban development is somehow 'natural' to North America, rather than the result of past

government policy decisions. In his historical study of suburbanization in the U.S., K. Jackson emphasizes that suburbanization is the product of government policies rather than the historical product of culture, geography or technology (Jackson 1985 in, Isin, Tomalty, 1993).

Though there is still some debate about the benefits of controlling urban sprawl, many municipal governments are actively engaged in programs to control its spread. There are also preliminary discussions about the feasibility of a national urban growth management strategy, under federal-provincial efforts to establish a National Strategy to limit Canada's emissions of greenhouse gases to 1990 levels by the year 2000. This is in response to commitments under the United Nations Framework Convention on Global Climate Change. Some provinces, such as Ontario, have begun to adopt policies which encourage the intensification of land-use in core urban areas.

Table 1, and a number of the tables which follow, were provided by the Canadian Urban Research on the Environment (CURE) Database and Information Project of the Federation of Canadian Municipalities (FCM). Information in the CURE Tables was obtained from 208 Canadian municipalities responding to a survey conducted by the CURE project in 1994. Table 1 illustrates the number of municipal governments undertaking various intensification measures and their relative stages of implementation.

Table 1: Urban Land-Use Intensification Measures of Municipal Governments, 1994

Activity	Municipal Policy	Municipal Plan	Program/Initiative	Implementation	
				Yes	Planned
<i>Conversion</i> - increasing the number of households within existing housing forms through renovations and additions.	29	30	10	37	11
<i>Neighbourhood & residential rehabilitation</i> - encouraging the refurbishment of neighborhood services, infrastructure and existing housing.	31	32	23	49	4
<i>Infill</i> - building new housing on vacant and underused land within existing residential developments	49	49	11	59	4
<i>Redevelopment</i> - building new housing on serviced sites whose original function has diminished.	32	37	7	41	6
<i>Mixed use development</i> - permitting an appropriate mix of residential, commercial and service uses in the same building, site or area.	41	49	8	52	9
<i>Adaptive re-use</i> - changing the function (zoning) of a site to residential.	29	40	11	47	4
<i>Suburban densification</i> - changing the specifications governing subdivision developments to allow for higher density development.	37	33	16	52	10

Source: CURE, 1994.

In a 1993 survey of 523 municipalities focused on housing intensification initiatives, senior planners were asked to answer a number of questions to identify trends. Selected results of the CMHC sponsored survey, *Resettling Cities, Canadian Residential Intensification Initiatives: Main Report*, include:

- Intensification policies and initiatives were highest (69 per cent) among larger municipalities with a population exceeding 100,000.
- Policies and projects to promote intensification were undertaken by all orders of government. Of the 291 identified, 67.6 per cent were provincial, 20.1 per cent regional, 4.6 per cent federal and 7.7 per cent intergovernmental.
- Issues such as fiscal concerns (26.2 per cent), housing affordability (25.4 per cent), energy conservation (15.9 per cent) and demographic pressures (15.1 per cent) were *very* important factors in making intensification a municipal issue whereas, disappearing farmland (25.6 per cent) and environmental concerns (28.5 per cent) were identified as *less* important factors in raising the issue. Larger municipalities were more focused on environmental concerns related to intensification than smaller municipalities.
- The strongest supporters of intensification were identified as municipal staff (48.7 per cent) and developers and builders (41.7 per cent), followed by municipal councillors (33.8 per cent).

The recent trend to increasing urban sprawl among most of Canada's CMAs has been focusing policy makers' attention on the related social, economic and environmental issues stemming from this development. Further work needs to be done to raise awareness of these issues and focus on integrated solutions involving all orders of Canadian government. Significant barriers to land-use intensification are described in Section 4.

A more detailed discussion of urban sprawl in Canada may be found in *Resettling Cities: Canadian Residential Initiatives*, R. Tomalty and E. Isin, and D. D'Amour's, *Towards an Investigation of Sustainable Housing*. A detailed examination of models of urban form and urban sustainability is contained in *Modifying Urban Form to Attain Healthy and Sustainable Community Goals: Issues and Examples*, by R. Perkins. A thorough exploration of the environmental benefits and risks associated with intensification may be found in R. Paehlke's 1991 report, *Environmental Effects of Urban Intensification*. In 1993, the Canadian Urban Institute began publishing *The Intensification Report*, a bi-monthly newsletter which contains articles that examine a broad range of issues and developments concerning intensification.

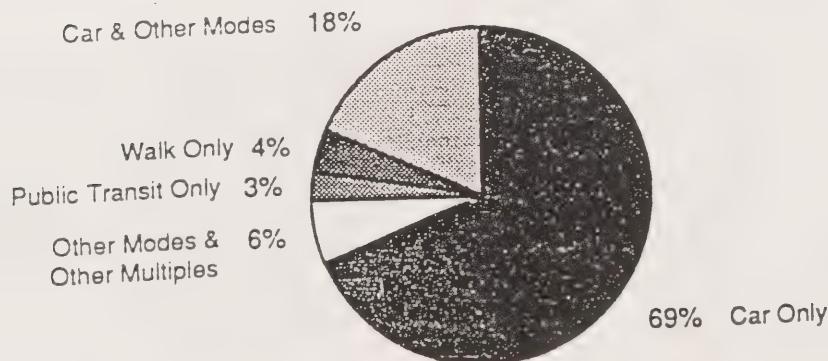
"The automobile has also had an extremely profound impact on the form, density and liveability of urban areas, contributing strongly to low density, spread urban development and continuing consumption of high quality farmland for urban purposes."

Urban Travel and Sustainable Development: The Canadian Experience, IBI Group, 1993.

3.2 Transportation Trends

Transportation planning is a critical element of urban sustainability, not only because of its ability to influence the consumption of non-renewable energy resources and emissions of air and water pollution, but also due to its important impact on economic development, land-use planning and the liveability of communities. The increasing use and affordability of private automobiles in Canada continues to greatly contribute to low-density urban sprawl. In fact, the form of many suburban settlements with large setbacks for shopping malls and offices and clearly separated commercial and residential land-uses assumes that everyone has universal access to a private automobile. The relative composition of urban transportation modes in Canada is represented in Figure 7.

Figure 7: Urban Transportation Modes In Canada



Source: *Statistics Canada*, (no.75-001E, 1992).

The environmental impact of automobile transportation can be separated into four categories:

- Vehicular manufacture: Impact on the environment of resource extraction, and the pollutants generated both at the time of manufacture and disposal.
- Infrastructure effects: Congestion, visual intrusion, severance and consumption of resources particularly with respect to land for roads and parking.
- Vehicular effect: The contributions of different types of vehicles to air, water, noise or visual pollution; their contribution to global warming; general health risks; safety to the user and the non-user; the efficiency with which they consume non-renewable resources.
- Traffic volume affects: Congestion may not only increase vehicular effects proportionately, but also increase the effects further as vehicle efficiency diminishes; providing new infrastructure to accommodate increased traffic is likely to generate further infrastructure effects (Association of County Councils *et al.*, *Environmental Practice in Local Government*, 1990, in Roseland, *Toward Sustainable Communities*, 1992).

In *Urban Travel and Sustainable Development: The Canadian Experience*, prepared for Canada Mortgage and Housing Corporation in February 1993, the IBI Group examined urban transportation trends and policies in 7 major urban regions across Canada. The report concludes:

The period from 1986 to present can be characterized as the time when urban transportation trends which tended to decrease the sustainability/liveability of urban areas (e.g. sprawl, congestion, increased auto dependency) began in earnest to negate the contributions of positive trends (e.g. increased transit ridership, cleaner automobiles)...In the absence of fundamental policy changes, virtually all growth trends point to a future urban transportation scenario where the private automobile is used more frequently to make longer trips at lower speeds, with serious impacts on the economic, social and environmental viability of Canadian cities.

Other highlights from the Report which reflect current trends in Canadian transportation include the following:

- Growing traffic congestion resulting from the increasing use of automobiles is being met with local and regional road expansion projects throughout Canada.
- Canada's future population growth, according to current trends, is likely to be accommodated in automobile-oriented, low-density modern suburbs leading to an increasingly dispersed urban population.
- Operating costs for transit services generally continue to increase throughout Canada while revenues decline.
- While some transit systems have been able to increase ridership or maintain their ridership numbers, transit use has not kept pace with population growth, resulting in declining *per capita* ridership figures.

Commuter travel statistics underscore the nature of urban transportation in Canada and some of the associated costs of urban sprawl and automobile dependency. According to Statistics Canada, only 8 per cent of employed Canadians did not commute to work in 1992. Automobiles are the dominant form of urban transport, with 7.9 million people using an automobile for at least part of their journey each day. For the majority that commute, the total time to work and back averaged 48 minutes each day during the week, with variations between urban regions. Residents in Toronto and Vancouver had the longest daily commute, averaging 60 minutes, while 10 per cent of the national average spent more than 90 minutes commuting each day.

The enormous amount of time Canadians spend commuting has tremendous social and economic costs in terms of lost productivity, and lost time spent on family and community-centred activities. The fact that the more wealthy households utilized private automobiles, and that the detrimental affects of urban air pollution are most keenly felt by the urban poor, also indicate some important social equity considerations related to auto-dependency. For example, measures designed to reduce automobile usage by increasing the costs of their operation are likely to impact more strongly upon lower income groups within society. The dimensions of the problem are further complicated by the fact that land-use patterns force many individuals to use automobiles.

While significant progress in reducing the growth of private automobiles has not been made, measures are either planned or underway to try to reduce the rate of growth in their use and to mitigate their negative environmental impacts. Table 2 illustrates the number of municipal governments among the 208 surveyed undertaking various types of sustainable transportation initiatives. The form and status of each of these initiatives is also presented. It should be noted that the relative impact of these initiatives on reducing automobile dependency varies considerably.

Table 2: Alternative Transportation Initiatives of Municipal Governments, 1994

Activity	Municipal Policy	Municipal Plan	Program-Initiative	Implementation	
				Yes	Planned
improve/increase public transit	36	19	16	28	12
improve/increase bicycle routes	29	35	24	39	27
improve/increase pedestrian routes	29	30	19	37	15
install/increase light rapid transit	11	6	4	5	3
install high occupancy vehicle lanes	7	7	10	7	2
facilitate/organize car pools	8		11	4	2
increase parking fees	8	3	6	8	6
reduce parking availability	7	4	4	6	2
traffic calming measures	8	3	14	11	6
facilitate/support telecommuting	4	1	5	2	3
provide incentives for alternative transport use	4	2	9	5	4

Source: *CURE*, 1994.

In *Urban Travel and Sustainable Development: The Canadian Experience*, the IBI Group evaluated the impact of various initiatives against six sustainability yardsticks. The results of this evaluation are summarized in Table 3.

Table 3: Initiatives Towards Sustainable Urban Travel: Summary of Anticipated Impacts

<i>Sustainability Yardsticks</i>	<i>Reduced Vehicular Traffic</i>	<i>Greater Conservation of Resources</i>	<i>Improved Environmental Quality</i>	<i>Increased Economic Efficiency</i>	<i>Enhanced Quality of Life</i>	<i>Broadened Lifestyle Choices</i>
M A J O R INITIATIVES						
Urban Structure/Design Policies	L	L	M	M	L	L
Transportation Infrastructure	L	L	M	L	L	M
Demand Management Practices	L	L	L	L	M	M
Transit Management Practices	M	M	M	M	M	M
Traffic Management Practices	m	m	m	m	M	m
Cleaner Vehicle Technology Development	m	L	L	M	M	M

Legend

Anticipated Impact of Initiative in Helping to Achieve Sustainable Urban Travel

L = Large Impact M = Moderate Impact m = Modest Impact

Source: IBI Group, Urban Travel and Sustainable Development: The Canadian Experience, 1993.

The overall growth rate in Canada's automobile stock was projected to increase at a rate of 2 per cent annually by the National Energy Board in 1994. The lack of progress in reducing dependency on private automobiles has complicated political, economic and social causes. Urban planning which continues to reinforce automobile dependency makes it more politically difficult to adopt measures to reduce their numbers, even when these measures involve the removal of existing subsidies. Furthermore, given that the automotive industry is a particularly powerful sector in Canada, support for the expanding use of private automobiles as a primary method of transportation in the private sector is considerable and encompasses a variety of related sectors.

Table 4 illustrates the importance of recognizing the integrated nature of land-use and transportation planning. It is a comparison of urban land-use densities, employment densities and housing types with transportation modes in 10 major cities around the world. Table 4 also illustrates the relative environmental consequences of these factors through the quantities of gasoline consumed and the amount of CO₂ emitted.

Table 4: The Relation Between Population Densities, Employment Densities, Travel Choices, Energy Use, and CO₂ Emissions: Selected Canadian and International Comparisons, 1991

City/Region	Population	Employment Density	Residential Density & Proportion of Single Family Houses in Stock	Car Ownership	Public Transport	Walking & Cycling	Gasoline Use	Carbon Dioxide
		Jobs/km ²	People/km ²	Vehicles /1000	Annual rides/ person	% of commuters	Annual MJ/ person	Annual tons/ person
Phoenix*	1,509,052	400	850	499	9	3	74510	5.1
Vienna*	1,531,346	3840	7210	311	313	15	10074	0.7
Tokyo	11,597,211	6630	10460	156	472	25	8488	0.6
Metro Toronto	2,276,000	2305	3613 - 35	493	186	--	25139	1.7
Greater Toronto Area	4,235,530	1571	2758 - 43	463	128	--	27324	1.9
Montreal Urban Community	1,775,871	2286	3580 - 12	369	225	--	19595	--
Greater Montreal Area	3,127,242	430	891 - 28	414	154	--	26221	
Vancouver GVRD	1,542,744	--	1286 - 53	202	94	1.2**--	--	--
Winnipeg	616,790	--	1344 - 60	509	87	--	--	--
Edmonton	616,741	--	1542 - 58	622	69	--	--	--

Source: *Adapted from IBI Group, 1993; Newman, Kenworthy, Cities and Automobile Dependence 1989, in Worldwatch Paper 98; and Alternatives to the Automobile: Transport and Liveable Cities, 1990.*

*- Figures for European cities are from 1980

** 1992 data from GVRD, 1993. Methodologies may differ for the Walking and Cycling category.

In their 1989 study of urban form, transport and energy use in 32 cities in North America, Europe, Asia and Australia, Newman and Kenworthy found that five major physical planning factors sharply distinguish automobile-dependent cities from those with having greater freedom of mobility. Cities with low automobile dependence: are more centralized; have more intense land-use in terms of employment and population per unit area; are more oriented to non-auto modes of transport such as public transit, foot or bicycle; place restraints on high-speed traffic; and offer better public transit (Newman and Kenworthy, in Roseland, 1994).

Efforts to substantially promote sustainable urban transportation must take into account the need for significant changes to the structure of various segments of the economy relating to the manufacture, sale and use of automobiles, as well as supporting infrastructure development. Without addressing the economic contribution of increasing automobile use, versus the social, economic and environmental benefits of promoting alternatives such as public transit, significant government actions to reduce automobile dependency are unlikely. A joint federal-provincial study is currently underway to examine the feasibility of constructing a high-speed rail line along the densely populated Windsor to Quebec City corridor. If implemented, the project would contribute to a reduction of automobile use and CO₂ emissions, as well as provide significant employment opportunities.

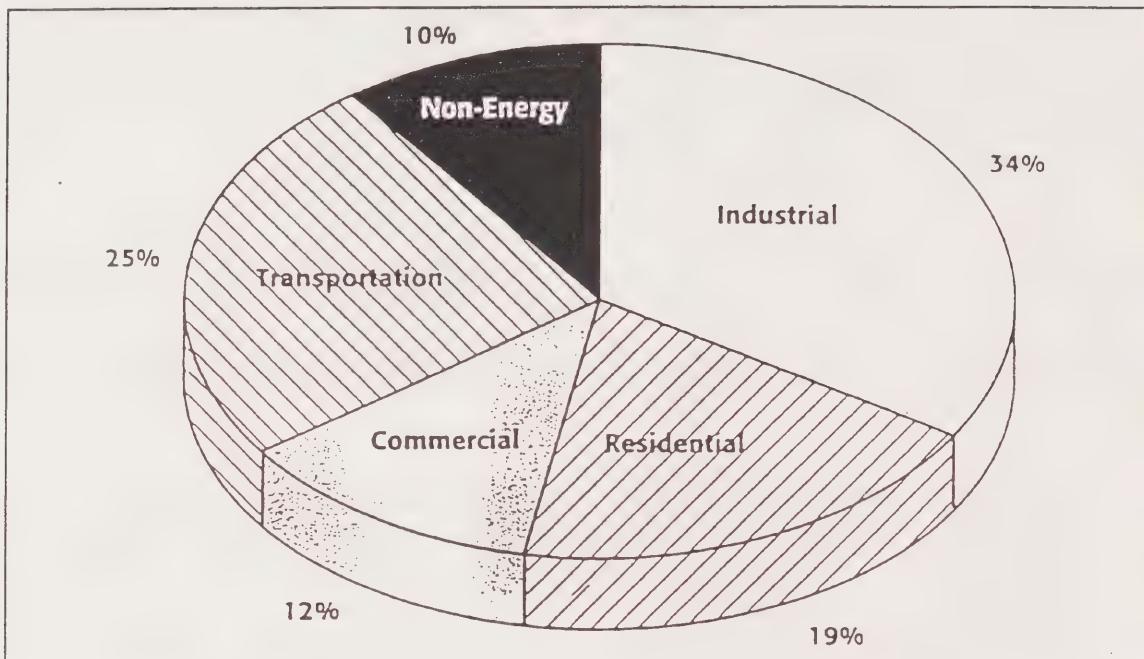
"The opportunities for municipal governments to become much more significant players in urban energy management for environmental improvement have only recently been identified. True urban energy management for environmental improvement is still in its early stages in Canada."

Environmental Improvement Through Urban Energy Management: Canadian Overview Paper, Torrie Smith & Associates 1994.

3.3 Energy Consumption and Conservation Measures

Inexpensive energy has contributed greatly to Canada's economic development and prosperity and continues to do so. Canadians are the highest *per capita* energy users in the world, partly a consequence of the climatic and geographic characteristics of the country. However, countries with similar climates use far less energy. In 1987, on average, each Canadian used 291 GJ (gigajoules) of energy, compared with approximately 280 GJ in the U.S. and 194 GJ in the Soviet Union. Canada's inefficient use of energy is, in part, historically related to its relatively low cost. The sectoral composition of energy end use demand for 1991 in Figure 8 illustrates the relative importance of the transportation and residential heating sectors as a percentage of energy demand in Canada.

Figure 8: Sectoral Composition of End Use Energy Demand, 1991



Source: National Energy Board (NEB), *Canadian Energy Supply and Demand, 1993-2010*, 1994.

Roughly 80 per cent of Canada's residential energy use is for space and water heating which is supplied by electricity, gas, light fuel oil and, in some regions, wood. The remaining residential energy use is largely for lighting and appliances. Residential demand for energy is expected to increase at a steady rate of almost one per cent each year. However, energy use per household continues to decline, the result of a number of factors which include: increasing thermal efficiencies in the housing stock and higher efficiency equipment for space and water heating as old equipment is replaced (National Energy Board, *Canadian Energy Supply and Demand, 1993-2010*, 1994).

Transportation energy use is dominated by road vehicles which presently account for 80 per cent of the total transportation energy consumed in Canada. Transportation energy products consist almost entirely of refined petroleum products, with limited utilization of alternative fuels such as propane and natural gas. The demand for motor gasoline is projected to grow at a rate of 1.6 per cent annually, an increase from the previous rate of the past 18 years. This demand projection reflects an estimated growth of 2 per cent in the total automobile stock annually, a fuel efficiency of 10 litres per 100 kilometers, and standard assumptions about the annual distance driven per vehicle.

Given the relative importance of the transportation and residential heating sectors, a number of provincial utilities and municipal governments have implemented energy conservation measures. The types of energy efficiency initiatives employed by municipal governments and their status are listed in Table 5.

Table 5: Energy Conservation Initiatives Among Municipal Governments, 1994

Activity	Municipal Policy	Municipal Plan	Program/Initiative	Implementation	
				Yes	Planned
energy efficiency standards for buildings	14	8	26	34	8
retrofitting of commercial buildings	2	3	8	5	5
retrofitting of residential buildings	4	4	8	7	3
retrofitting of municipal buildings	14	8	40	46	15
retrofitting municipal street lighting	23	16	27	69	5
land-use planning to promote energy efficiency (e.g. development patterns, housing intensification)	17	25	11	19	10
increasing the proximity of housing to employment opportunities	11	17	4	7	7
alternative fuel use in transportation, heating and cooling	2	2	12	12	4
renewable energy sources (e.g. solar, wind, biogas)	3	2	8	5	2
district energy systems	2	1	4	1	2
municipal vehicle fleet conversion	8	1	17	25	8
municipal transit fleet conversion			6	5	3

Source: CURE, 1994

Some of the energy conservation measures listed in Table 5, such as retrofitting commercial buildings, are covered under various provincial and federal energy efficiency programs. The FCM and Natural Resources Canada (NRCan) have recently launched an energy efficiency initiative which will provide services to help municipal governments save energy and money through activities such as retrofitting buildings and increasing the efficiency of water and waste water facilities. A detailed examination of urban energy management entitled, *Environmental Improvement Through Urban Energy Management -- Canadian Overview Paper*, has recently been developed for CMHC. The report concludes that urban energy efficiency management is still in its relatively early stages and therefore holds much future promise for considerable environmental and economic benefits. Those interested in Canadian urban energy management issues and initiatives should consider consulting this work. For further information on the implementation of district energy systems, which are not yet widely in use across Canada, the Canadian Energy Research Institute published *Realizing the Benefits of Community Integrated Energy Systems* by Morgan MacRae in June, 1993. Innovative developments which address a variety of municipal sustainability challenges from across Canada have been documented in *Sustainable Development and Canadian Cities, Current Initiatives*, published in 1994 by the Centre for Future Studies in Housing and Living Environments, CMHC, the Canadian Global Change Program, and the Royal Society.

3.4 Water Resources In Urban Areas

Canadians enjoy nine per cent of the world's renewable fresh water which moves through a multitude of freshwater lakes and rivers. The abundance of this fresh water has largely contributed to its under-valuation and inefficient use. Generally, Canadian households use twice as much water as European households but pay only half as much for it. As part of its commitment to develop and regularly report on environmental indicators, Environment Canada recently published the results of a survey of municipal water use and waste water treatment. The *Urban Water: Environmental Indicator Bulletin* reported on the results of the 1991 survey of 1,500 municipalities with a population of over 1000. Survey highlights include:

- Eleven per cent of all surface and ground water withdrawal in Canada is used for municipal purposes. Residential water use accounted for half the total municipal use while one-third was used by commercial and industrial establishments connected to municipal water supplies.
- Canadians have the second highest *per capita* water use in the world. The typical Canadian used 340 litres of water per day at home in 1991, which represents a seven per cent increase over 1983.

- Despite the abundance of water in Canada, in 1991, one in five municipal governments with water systems reported problems with water availability.
- Municipal water shortages can be attributed to: unrestricted use, increasing populations, inadequate delivery systems, inappropriate land-use practices in water catchment areas, periodic drought conditions and low water prices.

A large majority of water supply and treatment facilities in Canada are owned and operated by municipal and/or provincial governments or their agencies. The full costs of providing water and waste water services are not recovered through water pricing and are typically subsidized from general government revenues. The lack of widespread metering of water consumption in the residential sector contributes to over consumption of water and often forces municipal governments to spend more resources on water infrastructure than they would otherwise have to. In recognition of this deficiency, many municipal governments have programs to install meters and, on average, residential prices for water increased by 14 per cent between 1989 and 1991. Still, almost half of the households and firms are charged a flat rate or declining rates for their water. These are practices which significantly discourage water conservation.

The conservation of water has environmental and economic benefits. In cities where combined sewage systems exist, water conservation can reduce the frequency with which storm water and sanitary water become combined and are flushed into local water bodies untreated. A significant reduction in the demand for water may also result in significant savings for governments, by delaying or avoiding the need to upgrade or build new infrastructure. The collection, treatment and distribution of drinking water consumes energy resources which can be reduced through conservation measures.

Canadian municipalities have only just begun to reap the substantial economic benefits that may be derived from water conservation. According to information from the CURE, 37 out of 125 municipalities indicated that at present growth rates, they will need new sources of water within the next 10 to 20 years. Table 6 illustrates the number and range of water conservation and efficiency measures undertaken by Canadian municipalities according to results from the CURE survey.

Table 6: Water Conservation and Efficiency Measures Among Municipal Governments, 1994

Measure	Municipal Policy	Program/ Initiative	Implementation Yes	Planned
water metering	88	25	71	11
residential building retrofitting	6	12	13	9
commercial building retrofitting	11	5	11	4
municipal building retrofitting	8	10	14	7
water use restrictions	56	16	39	5
water audits	14	12	21	7
public education on water use	22	35	41	19
water leak detection and repair	41	30	76	12

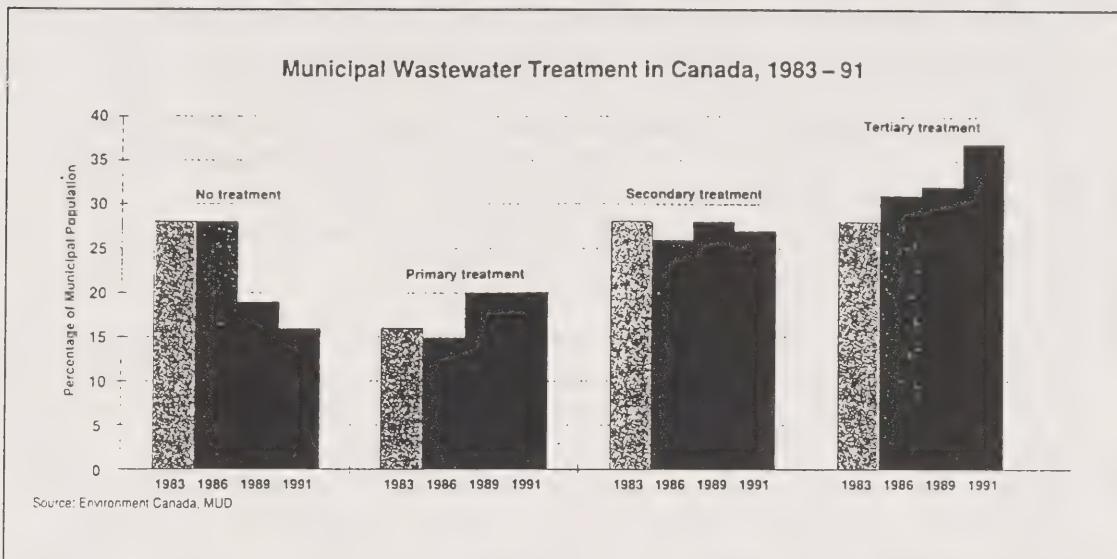
Source: *CURE*, 1994

The municipality of Waterloo, Ontario, is one of the largest in the country relying on ground water for its drinking water supplies. It has initiated an aggressive water conservation program in response to its diminishing supply. The program consists of retrofitting city facilities with water efficient fixtures; distributing water saving devices such as low-flow shower heads to every household in the city in partnership with the Regional Municipality of Waterloo; requiring that all new buildings have water saving fixtures as a condition of plan approval; and the establishment of a pilot project requiring developers to install cisterns for up to 20 per cent of the lots on a new subdivision. The cisterns collect rainwater which may then be used for lawn watering, car washing and ground water recharge. The Regional Municipality of Waterloo has also developed and implemented a Comprehensive Ground Water and Surface Water Protection Strategy to secure ground water and surface water quality by 1996 (*ICURR, A Resource Guide to Sustainable Development for Municipalities in Ontario*, 1992).

3.5 Waste Water Treatment

As of 1991, seventy-five per cent of Canadians were served by sewage collection systems. Within this group, 84 per cent had some form of waste water treatment, up from 71 per cent in 1983. Figure 9 shows that considerable progress has recently been made in the construction and upgrading of waste water treatment facilities.

Figure 9: Trends In Municipal Waste Water Treatment, 1983-1991



Source: Environment Canada, *Urban Water: Environmental Indicator Bulletin*. SOE Bulletin 94-1, 1994.

In the province of Quebec, significant progress has been made in the area of waste water treatment. The population served by waste water treatment increased from 12 to 56 per cent between 1983 and 1991 in Quebec. Generally, the level of waste water treatment (primary, secondary or tertiary) varies across the country although as Figure 9 demonstrates, significant improvements have been made over the last decade.

A number of innovative ways of treating waste water have been implemented in Canada. The City of Montreal, Quebec, has established an Aquatic Plant Water Filtration System to treat water from a small lake on Ile Notre Dame, used for recreation and swimming. An artificial marsh containing over 125,000 aquatic plants in an area of roughly 15,000 square meters and a depth of two meters was established to filter approximately one million gallons of lake water per day. The water passes through four different zones of aquatic plants, each with its own special purifying and filtering capacities. The emerging water is of good quality and safe for swimming. Since the creation of the marsh in 1989, tests have indicated that the amount of organic matter, solids in suspension and coliform in the lake water have been greatly reduced. The City of Montreal has also effectively incorporated ultra-violet treatment techniques for waste water treatment which have proven to be effective, without the use of chemicals.

In its 1993 *Seventh Biennial Report of Great Lakes Water Quality*, the International Joint Commission called upon society to adopt a clear and comprehensive action plan for the virtual elimination of persistent toxic substances. Among those chemicals identified as persistent toxins are chlorine and related compounds which are widely used in industry and the treatment of water and waste water. Increasing evidence pertaining to the negative health affects of chlorine related compounds to humans and other species in the Great Lakes Drainage Basin provide an incentive for municipal and provincial governments to begin to gradually implement alternative treatment technologies.

Given the growing fiscal constraints facing all orders of government and the extensive requirements for short term investments in water and waste water infrastructure (estimated at roughly \$7.5 billion by the FCM), the utilization of private sector expertise and financing through public-private partnerships is likely to increase. Although a commonly accepted practice in countries such as France and the U.S., public-private partnerships for water and waste water are not commonplace in Canada. There are a variety of public-private partnerships possible in water and waste water services which range from strictly maintenance agreements to long term build-operate-transfer contracts. These may confer a number of advantages which include: increased levels of financing for upgrades and new infrastructure development; increasing operation efficiency through the adoption of state-of-the-art technology; reduced maintenance costs; reduction in the time and expense associated with constructing new facilities; increasing progress towards full cost pricing for water and waste water services; and the establishment of a new source of tax revenue for local governments. A public-private partnership agreement was recently signed between the Regional Municipality of Hamilton-Wentworth and Philip Utilities Management Corporation. Under the agreement, Philip Utilities will manage the existing water and waste water facilities. Through the application of new technology, the company expects to increase the efficiency of the facilities by enough to generate revenues for the Municipality and achieve a reasonable return on investment. The operation will also provide a backdrop to showcase Canadian technology and expertise to potential international clients.

3.6 Air Quality and Atmospheric Change

The primary air pollutants in Canada are sulfur dioxide, nitrogen dioxide, ground level ozone, carbon monoxide and suspended particulate matter, including such things as incompletely combusted hydro-carbon fuels and dust from forest fires. The air in cities is generally more polluted than in rural environments. Ground-level ozone is primarily a problem in the Lower Fraser Valley of British Columbia, the Windsor to

Quebec City Corridor and the Southern Atlantic Region. The principal sources of airborne pollutants are vehicles, residential heating, and commercial and industrial processes. Air quality improvements in major cities are closely interrelated to land-use and transportation planning and require co-ordinated efforts, often beyond the existing jurisdictional boundaries of individual municipal, provincial and even national governments.

As part of its commitment to the Framework Convention on Global Climate Change, signed at the United Nations Conference on Environment and Development held in Brazil in 1992, Canada is currently developing a National Strategy in order to stabilize its overall emissions of greenhouse gases to 1990 levels by the year 2000. Over 70 measures are currently being evaluated according to their ability to reduce greenhouse gas emissions and their potential social and economic consequences. A number of measures under consideration have important implications for urban sustainability. They include: the promotion of public transit; establishing disincentives for single occupancy vehicle trips; increased use of cogeneration through, for example, district heating projects; and the establishment of a national urban growth management strategy.

Some municipal governments have taken innovative initiatives to reduce the emission of greenhouse gases. For example, the City of Regina, Saskatchewan, has committed itself to achieving a 20 per cent overall reduction from 1988 emission levels of carbon dioxide by 2005 and a 20 per cent reduction by 1998 in the amount attributable to the direct operations of the municipality. Strategies for the community and City operations were completed in 1991 and include measures such as: energy conservation; using alternative energy sources; using plants as natural carbon dioxide absorbers; and increasing employee awareness of energy conservation and other environmental issues. Each city department has been assigned an Emission Quotient, (in tons per year), along with annual reduction targets and associated costs. The program is expected to cost \$5.5 million or \$276 per ton of reduction with many measures being cost-effective or cost neutral.

Provincial government measures to improve urban air quality in British Columbia include mandatory vehicle emissions testing, and the planned use of alternative fuels in new vehicles. British Columbia is currently enacting clean air legislation based on the model already used in the State of California. Existing and planned measures by all orders of government will greatly contribute to reaching Canada's reduction goals for carbon dioxide emissions and will likely improve urban sustainability in the process.

3.7 Storm Water

Storm water runoff is recognized as a growing problem for water quality and ecological health of natural water courses in urban regions. Pesticides (which are intensely used in urban areas), salt, and heavy metals, oil and other contaminants from vehicles are sources of contamination. High peak storm water flows during storms and low flows during dry periods place considerable stress on natural urban areas around brooks, streams and rivers. In the winter, the build-up of large volumes of contaminated snow and ice from street cleaning activities present additional challenges for urban regions. Many initiatives to improve the situation are underway, including public education through storm drain marking programs to discourage illegal dumping, storm water retention ponds and treatment facilities. Since 1991 the City of Peterborough, Ontario, has been implementing measures to reduce storm water runoff and remove contaminants. These include on-site retention ponds on some industrial, large commercial and residential properties; the re-vegetation of open spaces (particularly streams and river banks); the substitution of asphalt and concrete surfaces like parking lots with permeable substances; and requirements to eliminate run-off during road construction (Tomalty, Pell, 1994). Several provinces have instituted requirements for storm water management measures in the development of new residential subdivisions. Given the present fiscal context, there are concerns expressed by municipal governments affected by such measures over the availability of financial resources for ongoing maintenance costs associated with storm water management facilities.

3.8 Solid Waste Management

One of the most high profile environmental challenges for municipal governments in Canada is solid waste management. Many urban areas are faced with diminishing landfill space or have already exhausted the capacity of their existing facilities and are now transporting waste to adjacent jurisdictions. By 1995, it is expected that landfills serving over 70 per cent of the Canadian population will be full (*The State of Canada's Environment*, 1991). In 1989, Canadians generated 21 million tons of solid waste, or nearly 1.7 kg per person each day. The search for new landfills has increased land-use conflicts, while incineration has met with considerable resistance in many provinces and been banned in others. Waste management is primarily the product of the wealthy, industrialized consumer society in Canada and, while not a direct function of urbanization, has become a high profile problem for Canadian cities. Solid waste management is regularly identified by municipal leaders as their community's primary environmental concern. Solid waste management is not generally considered to be a global environmental issue, however, the secondary

impact from solid waste, such as ground water contamination from landfill runoff and seepage, ocean dumping along coastal cities, and global warming contributes directly to global environmental challenges.

Since packaging constitutes approximately one-third of the total municipal solid waste stream, the Canadian Council of Ministers of the Environment (CCME) endorsed the National Packaging Protocol in 1990. It represents a commitment to six policies and three milestone targets with an overall goal of diverting 50 per cent of packaging waste from landfills by the year 2000. A multi-stakeholder task force of government, industry and environmental organizations has been established to promote voluntary participation in the Protocol. Several provinces have also enacted legislation to reduce the volume of waste generated from packaging and other sources. To date, a 21 per cent diversion of solid waste has been achieved nationally and some urban regions have achieved substantially higher rates.

Recycling is one of the most immediate ways that every household can make a day-to-day effort to minimize its negative impact on the environment. The methods used in recycling vary widely among municipalities, including: curbside and street corner collection, inclusion or exclusion of large residential buildings, weekly or bi-weekly collection and a range of materials collected. Recycling is performed by private contractors, municipal waste management departments or a combination of the two.

Throughout the early years, the materials collected were undervalued compared with the revenue projections which resulted in the programs operating at a net loss. Municipal governments are beginning to report profits for the sale of certain materials collected. This change can be attributed to efficiencies in the collection and administration systems as well as more stable and regulated markets for recyclables. A cost-benefit analysis of the different recycling methods in use in Canada and elsewhere would have benefitted municipal governments and private contractors implementing these programs. However, the promotion of "best practices" and "lessons learned" can still benefit current and future users especially when you consider the large expenditures being made to support these systems.

In 1991, the National Round Table on the Environment and the Economy and the FCM produced a document entitled, *The National Waste Reduction Handbook: An Introduction to Source Reduction and Recycling for Municipal Decision Makers*. It provides a comprehensive overview of the need for waste reduction, how to go about developing and implementing programs, and lists sources of government and non-government support. In 1994, the FCM also developed the *Municipal Guide for the Promotion of Packaging Waste Reduction* to help municipal politicians, administrative and financial officers implement practices which minimize packaging waste.

3.9 Hazardous Waste Management

The continuing production of hazardous waste is a serious problem both internationally and in Canada. The provinces of Quebec and Ontario are home to most of the country's manufacturing base and generate over 90 per cent of the hazardous waste in Canada. Government efforts have been launched in partnership with industry for the safe manufacture, use, transportation and disposal of hazardous wastes. The federal government recently established the National Pollutant Release Inventory which requires most major industrial producers of hazardous waste to report regularly on the nature and quantities of waste they produce. Canada's automobile manufacturers have been making significant progress in eliminating hazardous materials from their manufacturing process and end products.

Sites in many urban centres, formerly used for industry, pose contamination problems which inhibit redevelopment initiatives. This presents obstacles for core areas of urban regions attempting to increase population densities through residential intensification initiatives. Recently, a large housing development was planned for an old industrial site in the City of Toronto, Ontario, but had to be canceled due to unacceptably high levels of soil contamination which proved to be too costly to remediate.

An estimated 6.2 million tons of hazardous waste was generated in Canada during 1992. It has been calculated that each Canadian produces about 2.5 kg of hazardous waste each year, consisting of such items as paint, batteries, pesticides and pool cleaners. Several large municipal governments have established collection systems for household hazardous wastes and storm drains on roadways have been marked to alert residents that they are connected to local water bodies and should not be used to dispose of wastes. Many small businesses, such as dry cleaners and auto body shops, often incorrectly dispose of hazardous wastes through the municipal sewage system. In addition to its environmental impact, this behaviour can result in additional maintenance costs for municipal water infrastructure. There is considerable room for improvement in the area of household hazardous waste management among individuals and small and medium-sized private sector firms.

3.10 Green Space/Natural Areas

Green space or natural areas within urban regions play a vital and often overlooked role in the maintenance of human health and well-being. Not only do natural areas provide opportunities for urban residents to enjoy a variety of recreational pursuits, they allow for direct community involvement in educational activities and

empowerment through protection, preservation and ecological restoration activities. Local environmental groups have been embarking upon activities such as community clean-ups, community gardens, natural inventories to record the existence and status of native flora and fauna, stream restoration and other ecological restoration projects.

Over 50 municipalities surveyed through CURE identified policies for conserving natural areas and environmentally sensitive areas such as wetlands and bird sanctuaries. The designation of such areas for protection has also been a policy of provincial governments by exercising restrictions through the land-use development approval process.

In addition to their recreational and educational function, natural areas also play an important ecological role by, for example, helping to preserve biodiversity. In addition to providing habitat for regionally rare or endangered plant species, urban green space can provide important habitat for the estimated five billion birds which migrate to Canada each year, some from as far away as South America. The immense value of a healthy urban forest system has been well documented and many municipalities across Canada are actively pursuing urban forestry initiatives. The multiple benefits of urban forestry are expressed in the following quote from a paper entitled, *Managing Human Ecosystems: Principles for Ecological Municipal Management*, by Jeb Brugmann and Robert Hersh:

While requiring little human investment and energy, trees can simultaneously serve as an amenity for human enjoyment, a source of food and fuel, a habitat for various species, an air and water purification tool, a buffer against noise and pollution, an energy conservation tool to insulate buildings, a soil conservation tool, a sink for atmospheric carbon, and a lever to moderate microclimate. To achieve such a concurrence of benefits, however, urban tree planting must be taken in an elegant and strategic way. For instance, trees planted in the middle of the sod covered, chemical treated ecological wastelands we call urban parks do not provide energy conservation, soil conservation, noise pollution control, or if regularly subjected to lawn chemicals, food supply benefits. Urban forestry programs can be an inexpensive and low-maintenance approach to address all of the above needs, as well as many others, such as employment generation, the development of community cohesiveness and public education.

In addition to protecting and enhancing specific natural areas, efforts are underway to establish green corridors which physically connect otherwise isolated green spaces. The connection of significant areas of green space provides habitat linkages which are often critical for the reproduction of certain species while offering city residents additional opportunities for recreation. A thorough examination of the contribution of natural areas in urban regions may be found in *City Form and Natural Process*, by

Michael Hough. The establishment of a sense of stewardship between the urban community and its locally significant natural areas through community participation in program development and implementation is critical if individuals are to be persuaded to adopt many of the behavioural and attitudinal changes required to establish ecological cities. The integration of natural forms and urban forms through, for example, the establishment of green corridors within existing urban regions, will require vision, a commitment to long term planning and considerable resources to restore degraded areas.

3.11 Housing and Urban Sustainability

Housing has impacts which span across the environmental, economic and social dimensions of urban sustainability. Environmentally, matters such as the type of housing, the nature of the construction materials, quality of the housing stock, and the level of maintenance and upkeep have important consequences for renewable and non-renewable resource consumption, and indoor air quality. Economically, the construction, demolition and renovation of housing as well as the manufacture and processing of construction materials contribute significantly to employment throughout Canada. Socially, housing availability, design, and affordability all have important implications for communities concerning matters such as safety, social equity, and health. Following is a brief examination of selected trends related to housing in Canada and several related government programs.

Considerable amounts of government and non-government resources have been applied to improving the sustainability of new housing construction and design in Canada over the last fifteen years, primarily focused on reducing resource consumption. The federal department NRCan and the Canadian Homebuilders Association are currently building prototype homes in Halifax, Nova Scotia under the Advanced Houses Program. The Advanced Houses Program builds on the knowledge and successes of the R-2000 home energy efficiency program, pioneered in the province of Manitoba in the early 1980's. Houses under the new program are being built with energy-efficient technologies such as innovative heating, cooling and air conditioning systems, high performance windows, waste-water recovery and other advanced practices. Each house must meet strict environmental requirements including no CFC's; the use of the federal government's 'EcoLogo' certified environmentally responsible products; the use of building materials with recycled or recyclable contents; construction waste management; and composting facilities.

Another important resource consumption component of housing relates to its form. Multiple dwellings are inherently more energy efficient than detached houses due to

the decreases in exposed wall areas and the ratio of exposed surfaces to volume they provide. Energy efficiency and use by housing type is illustrated in Table 7. At present, approximately 60 per cent of Canada's existing housing stock is made up of low-density detached units (D'Amour, 1994).

Table 7: Energy Efficiency of Alternative Housing Types

Type of Unit and Zoning	Million BTUs Per Year for Space Heating	Energy Savings
One-storey single family home	64	Base
Two-storey single family home	59	15 per cent
Two-story duplex	45	30 per cent
Two-storey triplex	42	35 per cent
Low rise condominium or apartment, same space as above units	38	40 per cent
Typical low-rise apartments with less space than the above units	21	67 per cent

Source: Lang R., Armour A., in D'Amour D., *Towards an Investigation of Sustainable Housing*, CMHC, 1993.

In *Towards An Investigation of Sustainable Housing*, David D'Amour examines a number of important housing and community planning issues that relate to urban sustainability. John Todd, a biological designer, has proposed that future houses can be designed in a manner which allows their residents to produce some of their own food, energy and employment, thereby re-integrating the historical 'producer' and 'consumer' roles of the home (Todd, in Van der Ryn and Calthorpe, *Sustainable Communities: A New Design Synthesis for Cities, Suburbs and Towns* 1986, in Roseland, 1994). Increasing the local production of food through home design and the establishment of community gardens would support urban sustainability by reducing dependency on imported foods and providing opportunities for efficient and productive employment activities. If done in an ecologically sensitive manner this could further improve municipal waste management of organic wastes.

The availability of affordable housing is one of many important indicators of social sustainability. CMHC reported in its, *Strategic Plan 1992-1996*, that affordability is a problem in many urban regions in Canada and will continue to persist throughout the 1990's. According to a 1990 survey of renters between the ages of 20 and 44 years in eight urban markets, 80 per cent of renters could not afford a starter home. Moreover, a survey of housing listings in nine urban markets determined that 80 per cent of the listings were not affordable to renter households (CMHC, *Strategic Plan 1992-1996*, 1991). Although most Canadians are generally well-housed, roughly 15 per cent require assistance provided through social housing programs, often

administered through joint federal-provincial and territorial housing agreements. Of the 85 per cent who are well-housed, 80 per cent are in the private market with 62 per cent owning their own homes and 6 per cent receiving assistance. Working with the provinces, municipalities, non-profit organizations and co-operatives, CMHC had a portfolio of 630,000 units of social housing in Canada as of 1990.

CMHC recently commissioned a survey of innovative initiatives in affordable housing by municipalities across Canada. The report, *Municipal Initiatives in Affordable Housing*, documents over 60 initiatives under the categories: homelessness; community economic development; sustainable development; intensification; community improvement; partnerships; regulations; land and financing for new development; housing for elderly and special needs groups; community health and safety; home ownership; and housing information and referral services. According to the data obtained from the report, many municipalities are increasingly concerned about housing for the elderly and special needs groups. In large measure, this stems from Canada's aging population, a trend discussed in Section 2. Many elderly residents are 'house rich and cash poor' meaning that they do not have the financial resources to pay property taxes and properly maintain the homes which they own. CMHC has a variety of initiatives to ensure that the elderly are able to remain in their homes which may be found in *Housing for Older Canadians: New Financial and Tenure Options*. Municipal governments and non-governmental organizations have established focused support services to assist the elderly in many other areas.

The design of housing and residential developments has important implications for communities in terms of accessibility, health and safety, particularly for seniors, women, the disabled and families with young children. In, *An overview of the needs of children and youth in the urban community*, Polly Hill provides an examination of the needs of infants, toddlers, pre-schoolers, school-aged children and youth in Canada's urban centres. While statistics on housing development facilities for various categories of children are not readily available, Hill points out the need for housing and community design that meets the needs of children in different ages through, for example the existence of different types of indoor, outdoor, home and community recreational and play spaces.

"The Canadian view of sustainable human settlement development implies the need not only to achieve economic objectives and maintain ecological integrity, but also to consider the importance of a variety of social considerations, such as housing affordability, community equity, and responsiveness to changing demographic and other conditions."

Report of Canada to the U.N. Commission on Sustainable Development, 1993.

3.12 Selected Social Indicators

A generally accepted set of social indicators for urban sustainability has not yet been developed in Canada, although there are numerous statistics available and many methods to gauge the degree of social sustainability are already in use. For example, the dimensions of social sustainability have been covered by Quality of Life studies that focused on urban regions. Quality of Life studies employ indicators typically covering areas such as recreation and leisure; education; health; the living environment (housing, neighborhood and biophysical environment); and social order (Maclaren *et al.*, 1994). Other indicators which have been utilized in Quality of Life studies include the amount of green space within a municipality; family stability; and the availability of community medical, commercial and cultural facilities. The community-centred nature of many of these indicators and the wide degree of variation between communities undermine the usefulness of national data. Some of the following indicators may, however, provide a general outline of current trends in certain aspects of social sustainability within Canada.

"To create greater urban security, actions to prevent crime should be linked with those designed to increase sustainable development in urban areas. Sustainable development requires policies, procedures and international conventions that pay particular attention to human security, so that social and economic activities direct change in ways which are both equitable and in balance with the natural environment, both in the present and for the future."

International Centre for Sustainable Cities, Report of the Expert Group Meeting on Urban Security, Vancouver, British Columbia July 1994, Urban Security and Sustainable Development in the 21st Century.

3.12.1 Urban Crime

Canadians have recently become increasingly concerned about urban crime. The perception of an increase in the randomness of violent crime and the rising

participation of young people are concerns shared by many communities. Statistics on reported crimes and victimization surveys, which focus on determining the extent of unreported crime, indicate that police reported-crime rates have actually been decreasing since 1991 and that victimization rates are not substantially different from 1983 (Canadian Centre for Justice Statistics, 1993). Three of Canada's largest municipalities, Toronto, Vancouver and Montreal followed the national trend with declining crime rates in 1993 of two per cent, seven per cent and six per cent respectively. Toronto was the only municipality of these three that registered an increase in violent crimes (four per cent) over this period. The actual levels of crime and the perception of crime are both important and relevant indicators of community security and liveability.

3.12.2 Social Spending and Child Poverty

According to Statistics Canada, as of 1991 Canada spent, as a percentage of GDP: six per cent on education; 6.8 per cent on health; and 29.1 per cent on all social programs combined (Statistics Canada, 11-008E). Aggregate social statistics from Statistics Canada for 1992 state that 3.6 million Canadians received unemployment insurance benefits, 2.6 million received assistance from the Canada Assistance Plan, and 3.1 million received Old Age Security and or Guaranteed Income Supplements. The median family income for 1992 was \$47,719, with 13.1 per cent of families with low incomes. The average income for those in need of housing assistance was approximately \$12,000 annually in 1991. Given the current fiscal situation of the federal and provincial governments, it is expected that continued deficit reduction measures will reduce social spending in Canada.

Another way of assessing social sustainability is through child poverty. According to a recently released study conducted by the Canadian Institute of Child Health, Canada has a high rate of child poverty, ranking third among industrialized countries. Highlights of the report include the following:

- Almost 45 per cent of children in one parent families live in poverty.
- The suicide rate for children aged 10 to 14 has more than doubled over the last 30 years, the rate for young men ages 15 to 19 has increased four-fold since 1960; native teenagers have a five times higher chance of committing suicide than non-natives.
- Fifty-three per cent of young women 12 to 18 and 37 per cent of young men rate their lives as stressful.

There are significant regional and provincial variations among these social statistics. More effort must be given to ensuring that the needs of children and youth are being appropriately met in the development of measures to promote ecological cities. While crime statistics are promising, future trends, poverty and stress indicators suggest that some aspects of social sustainability will become a greater challenge in Canada in the near future.

3.12.3 Gender Issues

There are wide variety of women's groups advocating for further progress on a broad range of sustainability issues. According to *Canada's National Report to the United Nations for the Fourth World Conference on Women* to be held in September, 1995, in Beijing, China:

Women's groups have been among the most active on environmental issues. Public opinion surveys demonstrate that women as a group, are more concerned than men on the health effects and impacts on future generations of a whole range of environmental and resource conservation issues. Women show a higher level of concern about nuclear energy, clean water, wildlife preservation, conservation of agriculture lands and other resource issues.

The extent to which gender issues are reflected in a broad range of urban policies serve as an important indication of the liveability of a community. In 1992, fully employed Canadian women typically earned 71.8 per cent of men's full-time earnings and women are more likely to be involved in part-time employment (Statistics Canada, no. 11-008E). A number of measures to improve the level of pay equity and employment equity for women and minorities have recently been addressed by several provinces, such as Ontario, which has recently introduced legislation in both of these areas. The fact that women have lower incomes than men make women more susceptible to poorly designed housing and transportation infrastructure. Several volunteer women's organizations, such as Women Plan Toronto, have been working to promote an awareness among municipal planners and elected representatives of the importance of integrating women's needs into planning decisions and municipal operations.

Another vital issue is urban safety, as surveys find that one-half of all Canadian women over the age of 16 have experienced at least one incident of violence. Sixty per cent of Canadian women who walk alone in their area after dark feel "very" or "somewhat" worried doing so according to a 1994 report by CMHC entitled, *Women in Canada's Cities: Housing and Urban Services*. In Halifax, Dartmouth, Montreal, Ottawa, Toronto, Winnipeg and Vancouver community activists and professional women are working with municipal governments to examine steps local governments might take to make cities and neighbourhoods safer for women. CMHC and the Regional Municipality of Metropolitan Toronto have developed and are promoting the "safe neighbourhood initiative", a package of organizational and design features to improve safety. CMHC and others are also promoting the use, across Canada, of a safety auditing technique developed by the Metropolitan Toronto Action Committee on Public Violence Against Women and Children (METRAC). Similarly, the FCM has recently released *How to Build a Safer Community for Women - A Handbook for Municipal Leaders*, which highlights the steps a municipal government can take to increase women's safety.

At a more fundamental level, there remain profound inadequacies surrounding the role of women in urban affairs which require deep-seated changes in our society and governance. Canada's Jean Augustine stated in her concluding remarks as chair of the October 1994, OECD High Level Conference *Women in the City: Housing, Services and the Urban Environment*:

...that urban governance and policies be rethought in order to respond better to the needs of the whole, heterogeneous urban population and in particular, to better reflect the gender aspects of urban development. To date, most action has been ad hoc or pilot projects implemented on behalf of women, where urban structures and services have been adapted to meet the needs of disadvantaged groups such as elderly women and single parents. Too little has been done to plan and manage cities with women.

A fresh perspective is needed. Women should now be recognized as an integral part of urban management. Such integration of women and men in the control of their everyday life will go far in improving gender equality. The new political and economic context must not exclude anyone from participation in urban affairs. It will require a spirit of dialogue and partnership (Conclusions of the Chair, OECD, DT-VA(94)6, 1994).

3.12.4 Health

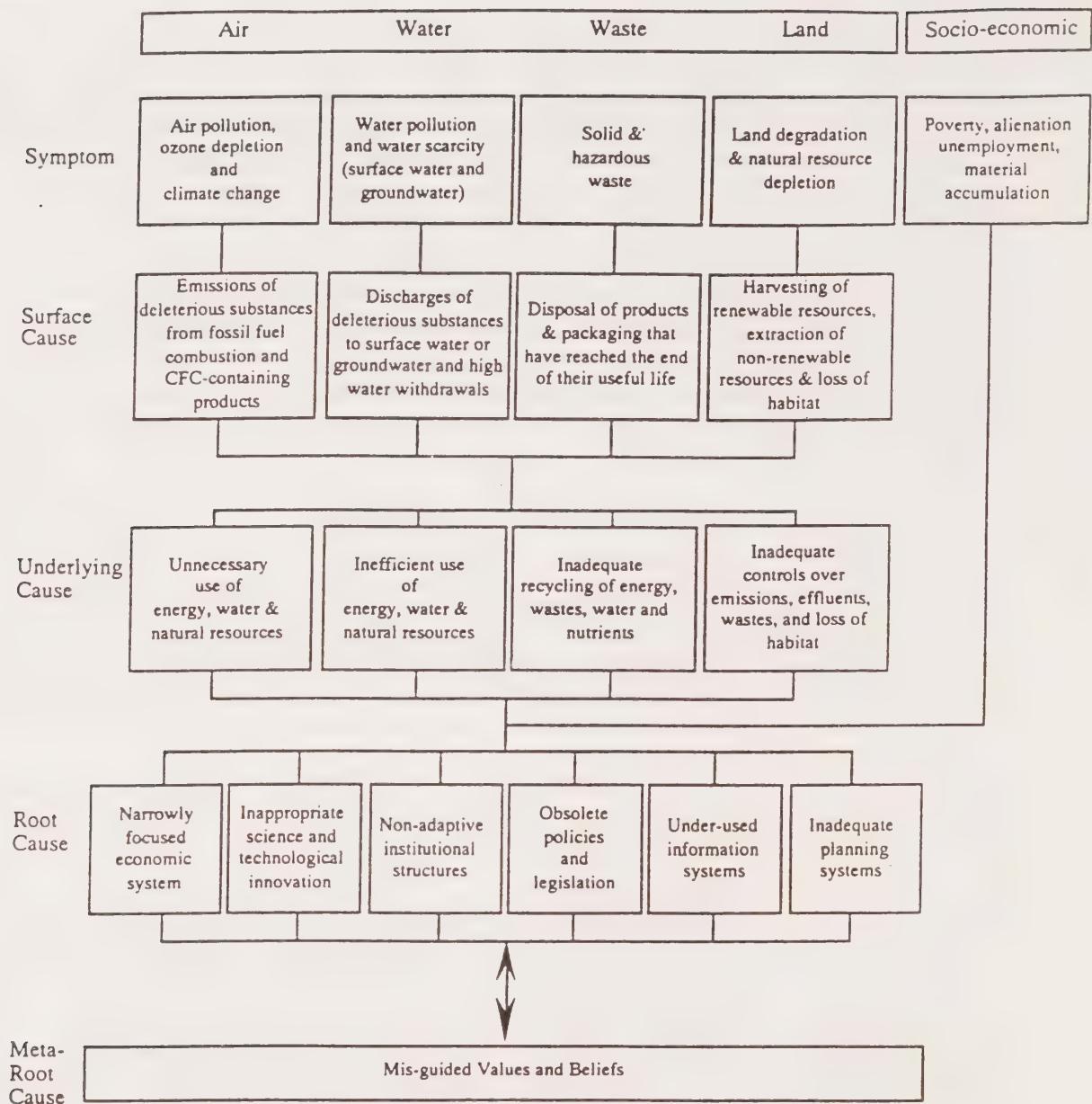
While there are differences among the provinces, overall, 87 per cent of Canadians reported that their health was good in Canada's 1990 Health Promotion Survey. The survey involved interviewing over 13,000 Canadians from all provinces on their attitudes and health practices. Several issue areas covered included: smoking; drinking; tranquilizer and drug use; frequency of exercise; preventative health care; and the proportion of the population covered by dental insurance. Canadians are undoubtedly pleased with their health. The high level of health care across Canada is under increasing pressure from fiscal cutbacks. Equal access to the same relative level of health care services for all Canadians may be threatened. There have also been repeated criticisms that we need to adopt a more preventative and community-based approach to health care. Several provinces have implemented pilot programs of this nature.

While the social statistics and trends identified in Section 3 may convey a general sense of the national state of social sustainability, they are not comprehensive and say little about the specific circumstances of individual communities, some of which are facing high levels of unemployment and are heavily reliant upon social assistance. The federal government is currently examining options for a comprehensive reform of social programs in Canada and Canadians are currently engaged in a debate about the future of their social programs.

4 OUTSTANDING URBAN SUSTAINABILITY CHALLENGES AND OPPORTUNITIES

Canadians have begun to make significant progress in many areas fundamental to developing urban sustainability. Much remains to be done however, both in terms of developing and implementing policies that promote sustainability, and in furthering our understanding of the complex web of interlocking relationships between the social, economic and environmental characteristics within urban regions. While considerable efforts are underway by each order of government, the overall effectiveness of these activities may be limited if they do not adequately address some of the root causes of our unsustainable development patterns. The root causes of principal environmental challenges were identified in a CCME sponsored publication, *1993 Environmental Scan: Evaluating Our Progress Towards Sustainable Development*.

Figure 10: Symptoms and Root Causes of Environmental Degradation



Source: CCME, 1993 *Environmental Scan: Evaluating Our Progress Toward Sustainable Development.*

Figure 10 demonstrates the interrelated nature of the social, environmental and economic components of sustainability. Moreover, it shows that the environmental symptoms resulting from unsustainable urban development have a number of root causes and meta-root causes as their foundation. The relationship between root causes and society's values and beliefs is reciprocal - positive changes in one will often influence the other. If lasting progress toward ecological cities is to be made, both root and meta-root causes must be the primary focus of our efforts. Section 4 is concerned with describing some of the root and meta-root causes illustrated in Figure 10 that act as challenges to urban sustainability. Section 5 highlights a number of policy tools which may be used to begin to address the root and meta-root causes challenging progress toward urban sustainability.

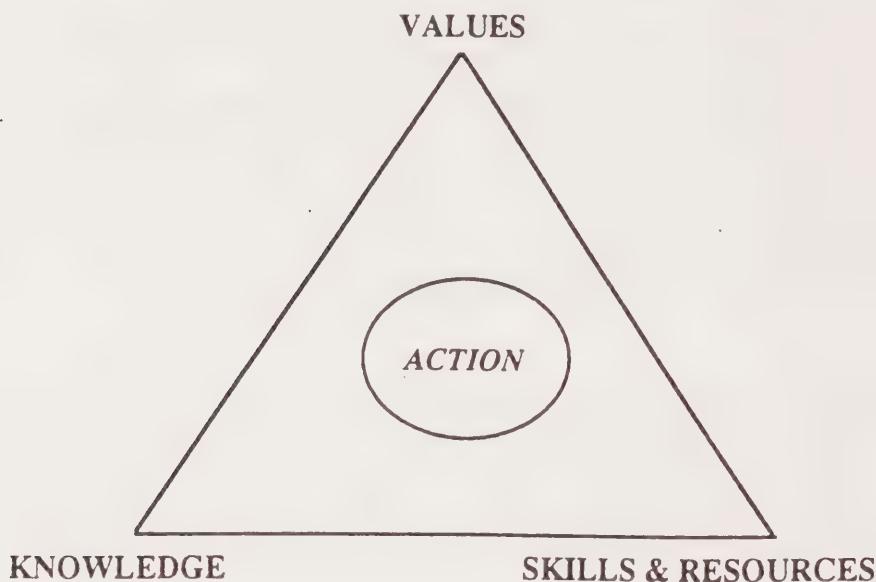
"The ecological correctness hasn't hit Canada in the way it has, for example, in Germany or the Netherlands. People don't hold one another accountable for their personal consumption habits."

Jeb Brugmann, Secretary General, General International Council for Local Environmental Initiatives, 1994.

4.1 Values and Beliefs

There are a number of commonly held social values and beliefs among Canadians that have been identified as challenges to the establishment of urban sustainability. The relative importance of values and beliefs is represented in Figure 11 which illustrates the relationship between values, knowledge, skills and resources - and action. The right combination of each element is required to effectively pursue a particular action in support of urban sustainability. For example, a municipal government may have the skills and resources required to install water meters in homes, as well as the knowledge that this move is necessary to improve conservation and increase the life span of existing water infrastructure. However, the majority of the community may be opposed to a user-pay approach to water consumption. Many may not believe water conservation is important as their values have not changed from the 1960's when inexpensive and abundant water was a given. Municipal politicians in Metropolitan Toronto recently were presented with three long range land-use development scenarios for the region in developing policies for their Official Plan. The development pattern they chose as an objective, while perhaps not the most sustainable, largely reflected what was considered by many to be the most socially and therefore politically acceptable alternative.

Figure 11: The Interrelationship Between Values, Knowledge, Skills and Resources - and Action



Source: Learning for a Sustainable Future, 1994.

To date, much of what has been accomplished has not yet required fundamental changes in society's values and beliefs. However, significant progress toward urban sustainability in Canada requires that progress be made on changing social values. The CCME report, *1993 Environmental Scan: Evaluating our progress toward sustainable development*, recognized the importance of Canadian social values to sustainability and described several broad value-related trends:

Our research revealed that a growing willingness exists among Canadians to treat values and beliefs as serious factors in environmental decision-making. In particular, values that support consumerism and unlimited economic growth are now seen by some to be undermining the carrying capacity of the Earth. Although this is by no means mainstream thinking ... it has taken hold in grass roots organizations across Canada. While environmental concerns still rank high among Canadians, they have been overshadowed by short-term economic concerns.

The following values and beliefs were identified by workshop participants, those interviewed for the Overview, and from recent literature, as being important challenges to urban sustainability. The extent to which the following values and beliefs exist in a given community will vary. Several of the values highlighted here are deeply rooted and highly resistant to rapid change - others are less so. The ideas expressed below are value judgments about commonly held beliefs within Canadian society and to a great extent, other industrialized nations as well. They are not representative of the attitudes or opinions of all of the participants who contributed to the development of the Overview.

- Consumption/Materialism - Values centred upon increasing levels of consumption were cited as a challenge by many participants and as the foremost challenge by several. High levels of consumption are a root cause of air, water and land pollution in urban regions, and the overall erosion of the ecosphere's carrying capacity. One respondent noted that roughly 80 per cent of consumption by Canadians takes place in urban regions. It was also suggested that advertising plays an important role in promoting and reinforcing materialistic values within Canadian society.
- Ecological Awareness - While environmental concerns remain high, environmental considerations are not well-integrated into individual or societal decision-making. This is said to be linked to several commonly held beliefs: humans are separate from and superior to other species in the natural world; and urgent actions involving changes in our behaviour are not required since science and technology will eventually solve all of our future problems. It was also suggested that these beliefs are reinforced by the fact that many urban dwellers have little experience with natural areas, given that their urban centres are often lacking in biodiversity. Instead, they are surrounded by engineered environments which contribute to the perception of our separateness from nature. Cities, in particular, are considered by many to be places unworthy of environmental concern. The 'environment' is not in the city, it is somewhere else.
- Short Term Thinking - A central component of an ecological city is that decisions are made over longer time horizons. In our society, however, short term decision-making dominates most private sector and political organizations and is reinforced by the processes which guide the operation of existing institutional structures. This makes it difficult to engage in long term planning. The need for longer 'time horizons' for transportation and land-use planning was expressed as vital to the achievement of urban sustainability by several participants.

- Individual Over Community Interests - The severe time demands on many workers was cited as an important factor inhibiting community participation and volunteering, cornerstones in the development and maintenance of a sense of belonging within a community and community vitality. The focus on individual pursuits is reinforced by employment trends over the last decade or so. Since the 1980's real family incomes have dropped in Canada, despite the fact that many families now have two earners working more than 40 hours each week (O'Hara, *Working Harder Isn't Working*, Perception Vol. 18, No. 1, 1994). The fact that individuals are working longer hours than they did 20 years ago, leaves little time remaining for community-centred activities.

The decrease in leisure time also helps to contribute to a 'fast paced' lifestyle by, for example, causing individuals to choose private automobiles for commuting, primarily since they are a faster mode of transport than public transit (Statistics Canada, no. 75-001E, 1992). Respondents suggested that the development of a sense of community was a long term endeavour and that the lack of public participation in local governance in some areas may be attributed directly to the absence of community in some urban regions.

- NIMBY (Not in My Back Yard) - The concept of NIMBY is cited as a social challenge to establishing a more regional approach to issues such as affordable housing, transportation, and land-use intensification. NIMBY occurs when a very vocal interest group or entire community lobbies to block a measure which, while possibly an imposition on the community in question, may serve a broader interest. For example, in a 1993 survey of senior municipal officials on land-use intensification initiatives, 79.5 per cent cited the resistance of existing residents as a barrier to implementation (Isin, Tomalty, 1993). High profile land-uses such as the siting of landfills and hazardous waste destruction facilities run into solid NIMBY opposition and often receive considerable media attention which can act as a further obstacle.
- Automobiles - Automobiles are firmly entrenched in many aspects of Canadian culture and tradition. They have long since been elevated above the status of a normal consumer good, carrying considerable weight as a status symbol. Many Canadians rely heavily on automobiles for personal mobility and some have come to view their ability to drive their cars as a 'right', rather than a privilege. Canadians have the second highest number of vehicles, 622 per 1,000 population, among all OECD countries after the U.S. (OECD in, Statistics Canada, no. 11-008E, 1994).

- Work/Home Dichotomy - The entrenched notion of the separation between work and home may represent an important barrier to urban sustainability. It is said to contribute to NIMBY opposition to community economic, home-base employment initiatives which help to reduce commuter transportation, stimulate local economies and maximize the use of the existing home infrastructure. It was also suggested that the home/work dichotomy value also supports the practice of separating land-uses through zoning bylaws. Commercial and light industrial land-uses situated alongside or within residential areas would help to reduce auto-dependency.
- Demand for Single Family Dwellings - A strong social value is placed on this type of dwelling by most Canadians and this was cited as a challenge to housing intensification. Consumer preference for larger lots was cited as the number one barrier to intensification among senior municipal officials in the intensification survey (Isin, Tomalty, 1993). The energy efficiencies of housing forms, outlined in Table 8, demonstrate that this value does not lend itself to promoting energy conservation through more energy efficient housing forms.

The values and beliefs of Canadians are constantly evolving and must be encouraged to change in a manner which is supportive of policies that promote urban sustainability. Academic research in a new field called "behavioural economics", which attempts to discover how people make decisions between different economic tradeoffs, has found that individuals value economic losses more highly than gains. In other words, they are willing to pay more not to lose something they have than to get something of equal value they do not have. This insight suggests that in developing education and communication programs to promote sustainability, programs should be structured to make people aware that they are already losing something (the endowment of their natural resources) and that only by making changes will they recover their losses (CCME, 1993 *Environmental Scan*).

The current behaviour of Canadians toward the environment was recently summarized as follows:

*Environmentally motivated actions are balanced against the desires for convenience and flexibility, comfort and safety. While many individuals would be unwilling to give up their automobiles, they seem to be eager to take other actions to benefit the environment, if the level of inconvenience was relatively minor (Statistics Canada, *Human Activity and The Environment*, no. 11-509E, 1994).*

"We've got to get the environment out of the environment box."

Mark Roseland, Centre for Human Settlements, University of British Columbia, 1994.

4.2 Information/Education

Undoubtedly, many of the predominant social values and beliefs which pose challenges to sustainability will change if the appropriate information about the importance of sustainability is made regularly available in an effective manner. Many interview respondents indicated that while significant strides had been made to alert society to the need for sustainability, educational initiatives would continue to play a very important role, particularly when they focus on young people. A number of respondents strongly expressed a concern that thus far, environmental messages had generally failed to demonstrate a connection between broader concerns about global warming and ozone depletion and individual responsibility relating to the consequences of our day-to-day activities. In general, a lack of awareness exists among urban residents about the impact of their activities on the local, regional and global ecosystems. While small segments of many communities have developed a sophisticated knowledge of the state of their local ecosystem, the absence of what may be called 'environmental literacy' within communities was identified as a barrier to establishing aggressive public policies in support of more sustainable land-use practices.

A considerable amount of research has been undertaken on the subject of developing and utilizing new indicators in Canada. Providing regular reports on a variety of environmental or 'sustainability' indicators is an important method of increasing society's general awareness of the need for more progress toward sustainability. Indicators may also provide a measure of the effectiveness of specific policy measures and help integrate environmental factors into traditional cost-benefit economic based decision-making. The recent trend toward the development and implementation of sustainability indicators among municipal governments is promising and should receive support from the federal and provincial governments. A recent study on municipal State-of-Environment Reporting (SOER) indicated that a number of barriers exist to conducting, improving and expanding upon these environmental policy and educational tools. These include:

- Significant financial and personnel resources are required, particularly if original research must be undertaken to gather data or if there is a high level of public involvement.
- There is often a lack of expertise within municipal staff to properly address the conceptual and theoretical issues in understanding environmental systems.
- Major gaps in our knowledge of the environmental impacts of human activity at the municipal level and the lack of a holistic framework for measuring sustainability.
- The lack of a consistent, comprehensive set of indicators and easy access to data to support such indicators, making it also difficult to draw comparisons between municipal governments.
- The lack of a common framework for the identification of indicators at the municipal level (Maclarens *et al.*, 1994).

An overview of the use of State-of-Environment Reporting and other indicators as policy management tools will be examined more closely in Section 5.4.

Several participants, who were also municipal government employees, suggested that the public's lack of understanding of the environmental component of their municipal taxes is a related problem. For example, municipal efforts to connect payments for water and solid waste disposal services to individual levels of consumption of these services regularly run into public opposition, even though these services are often subsidized through general municipal tax revenues.

Several participants also expressed the need to publicize regular sustainability indicator reports, in a similar manner to that accorded to economic and social indicators. Such a move would help to increase public awareness of the need to adopt measures which support the development of urban sustainability.

"Wherever possible we should be building plans, programs and structures around patterns of urban activity."

Lionel Feldman, *Urban Focus Series 91-4*, Canadian Urban Institute, 1991.

4.3 Institutional

Institutional frameworks are constantly evolving, primarily in response to changing financial, social and environmental needs. While there are a number of significant institutional challenges to urban sustainability in Canada, innovative institutions, operating outside of existing frameworks, have already been developed and will likely continue to develop in response to the many challenges of sustainability. (Some of these integrative institutions are described in Section 7). Although the establishment of new institutions is an important step, changes to existing institutions are also required to address the complex and interconnected challenges of urban sustainability. In general, pressures for institutional change in governments in Canada are emerging from several different areas:

- **Fiscal** - The widespread need to bring government expenditures in line with revenues provides opportunities to restructure federal, provincial and municipal governments in a more cost-effective and integrated manner. Increasingly, recognition of government financial impediments to renewed economic prosperity provides a strong impetus for institutional changes, particularly where the overlap and duplication of services occur.
- **Economic** - The current complexity of institutional authority in many urban regions is cited as a barrier to new business development, preventing new investment and employment opportunities. For example, the province of Ontario's 1992, *Guideline Directory: A Listing of Provincial Policies and Guidelines Related To Land Development*, described policies administered by eight different Ministries which may have an impact on new development. In addition to the complexity of fragmented institutional authority, the lengthy amount of time required for many approvals is often cited as a barrier to local economic development.
- **Political** - There exists a high degree of public frustration with current taxation levels, which are linked to the widespread perception among Canadians that there is too much government. The need for 'delayering' or rationalization among municipal governments is seen by some as a primary means of increasing efficiency as a way to help avoid the need for further tax increases.

- *Awareness of the Need for Institutional Change* - It is becoming increasingly recognized that many of our current institutional structures are incapable of addressing the cross-sectoral, interconnected challenges presented by urban sustainability. Politicians, government officials and a variety of individuals from non-governmental organizations who wish to work toward urban sustainability and are frustrated in their attempts to do so, provide important internal and external forces to promote and guide institutional changes.

Two multi-stakeholder workshops were recently held on the subject of institutional challenges to sustainability. The Fraser Basin Management Board held an intergovernmental workshop on shared program delivery in the Fraser River Basin in March 1994, bringing together 85 participants from the three orders of government, the regional government and non-governmental representatives. A similar workshop was held in April of 1994 by the Waterfront Regeneration Trust to discuss means of implementing 'watershed stewardship' in the Greater Toronto Area bioregion. This workshop was attended by over 100 participants from government and non-governmental organizations. Following is a synopsis of the primary institutional challenges reported from these two workshops:

- There is a close linkage between, and considerable overlap among, the boundaries and mandates of existing government structures. The issue of boundaries must be addressed as part of the evolutionary process of changing mandates. The current multiplicity of boundaries results in confusion, duplication and a lack of trust among government and non-governmental stakeholders.
- The existing pattern of program delivery among all orders of government is characterized by duplication and gaps among planning, project design, regulations, operations and implementation.
- Improved communication is required for all orders of government to decrease duplication, work smarter, build partnerships and gain the benefits of streamlined activities.
- There is a need for a shared vision to help promote partnerships among different organizations.

- There is a pervasive lack of trust in and among all orders of government, including both politicians and bureaucrats. This may also be extended to non-governmental stakeholders. Accountability is considered to be the greatest at the local level, where funding is most limited. Current experience is that responsibility is being downloaded without funding and that blanket policies which establish new municipal responsibilities are not applicable to all municipalities in a given province.
- Natural boundaries, such as watersheds, are not reflected in political boundaries, often resulting in jurisdictional gridlock and 'turf wars'. A measure of centralized control or co-ordination is required.
- Short political terms of office do not lend themselves to long term planning and a commitment to taking unpopular measures in support of sustainability on the part of politicians within all orders of government.
- There needs to be more equitable access to information and co-ordination of data collection and studies (*Inter-government Workshop Report*, Fraser Basin Management Program, 1994 and, *Watershed Workshop Synopsis*, Waterfront Regeneration Trust, 1994).

These statements demonstrate that there is a growing need for institutional reform among governments to improve urban sustainability in Canada. A greater degree of integration and co-ordination between and within existing structures is required. In 1993, the Intergovernmental Committee on Urban and Regional Research sponsored a survey entitled, *Environmental Policy Review of 15 Canadian Municipalities*. It found that among 15 large municipalities, 11 cited the lack of authority to implement environmental policies and programs as a barrier to progress. This included progress over matters such as the enforcement of chlorofluorocarbon bylaws, the control of tree cutting on private property, control over the management of rivers, and implementing stringent packaging regulations (Ouellet, 1993).

In recognition of internal institutional challenges, many efforts are now underway to promote better departmental integration within municipal governments. Table 8 illustrates the types of institutional change which have been introduced among Canada's municipal governments.

Table 8: Organizational Changes For Municipal Environmental Management, 1994

Position/Office/Department/Committee	Yes	No	Planned
Environmental manager/coordinator position	37	134	2
Environmental planner position	35	136	
Environmental engineer position	24	139	3
Environmental office	15	149	
Department responsible for coordinating environmental activities	44	127	1
Inter-departmental municipal staff committee or task force	25	131	2
Municipal council environment committee or task force	51	109	1

Source: *CURE*, 1994

Just as there is no universally applicable ecological city design, it is unrealistic to expect that a model institutional system for sustainability can ever be developed. Rather, existing systems in Canada must evolve towards more sustainable forms in response to many of the challenges identified by participants in these workshops. There are, however, certain characteristics of institutional systems which, if firmly established, would help contribute to integrated decision-making structures and processes in support of sustainability. These are described in more detail in Section 5.3.

In addition to governments, educational institutions share many of the same challenges. While educational institutions have been making progress in their research on sustainability, concern was expressed by several respondents that many of these institutions are still structured vertically, according to rigid, disciplinary lines which often fail to recognize the integrated nature of sustainability. The view was expressed on several occasions that the importance of post-secondary education for urban sustainability lies not only in what is taught, but what is not. The lack of sufficient integration between subject matters such as business, economics and engineering with ecology, wrongly suggests that these fields remain unrelated.

"Governments have been relatively comfortable delegating the round broad fuzzy issues to round tables, but not the detailed implementation".

Sheldon McCleod, Canadian Council of Ministers of the Environment, 1994.

4.4 Public Participation/Consultation

In recognition of the value and importance of public participation and input, consultations have become a widely accepted practice among all orders of government in Canada. Both individuals and non-governmental organizations are given an opportunity to comment upon the formation of public policy or the implementation of programs, through a variety of mechanisms. At the municipal order of government, four types of public participation generally allow community involvement in decision-making.

- Community consultations - involve asking the community its opinion on a proposal or topic, sometimes after detailed plans have been made.
- Community organization - efforts are made to get a community to support a particular proposal or program with a definite goal as its outcome. Community involvement may also be adversarial in nature, flowing from opposition to a proposal as is often the case with NIMBY.
- Community planning and development - various stakeholders come together to establish a plan for the future direction of the community. Local round tables and citizens' advisory committees are examples of this type of involvement.
- Community empowerment - a community takes on power for itself and exercises that power for the betterment of the community. This includes allowing citizens to become actively involved in planning and implementing local projects. (Canadian Urban Institute, *Environmental Indicators for the City of Toronto*, 1992).

While positive examples of successful public consultation and participation are numerous and their benefits well documented, a number of specific challenges were identified during the ecological cities workshop, participant interviews and literature review that may help to inform future public consultation and participation initiatives.

Some of these are:

- Many consultation and planning processes initiated by different government departments or orders of government often occur in isolation from each other. This commonly results in participant fatigue and a series of narrow recommendations which do not consider broad, ecosystem implications and cross-sectoral linkages. Mechanisms are not in place to integrate consultation processes associated with project and policy reviews or planning activities.
- Public consultation builds expectations among participants that are not often realized. Consultations to establish broad strategies and plans for sustainability must include participants who possess the responsibility and the authority to ensure successful implementation.
- Effective public consultation requires that participants are properly informed about the nature of the issues and the consequences of various outcomes. This is not always the case. Well-informed participants in municipal consultations may help to minimize NIMBY.
- Public consultation involving non-governmental stakeholders can be time consuming, limiting the ability of some stakeholders to participate. Resource constraints are increasingly a barrier to public input from non-governmental organizations as the government demand for consultations grows.
- Many consultation processes are too lengthy and topic areas are not well-defined. These factors result in participant fatigue. There is a need to establish appropriate processes to ensure that the length of the consultation process is not too great, without limiting the substance of matters under consideration.
- Consultations are not always the most appropriate means of developing policies.
- Public consultations can be used as a tool to delay hard decisions and may thereby act as a substitute for political leadership.

The public has been a driving force for change, particularly at the municipal order of government which is considered by some to be held more accountable by its constituents than the provincial or federal governments. Public involvement in decision-making and increased empowerment are important developments, that, if utilized correctly, can significantly improve progress toward urban sustainability. The strengthening of grassroots education and direct participation in decision-making can help to build a stronger sense of community. They also allow for greater community ownership over the decisions which affect it.

"Bureaucratic socialism collapsed because it did not allow prices to tell the economic truth. Market economy may ruin the environment and ultimately itself if prices are not allowed to tell the ecological truth."

Ernst U. von Weizsäcker, Institute for Climate, Environment and Energy.

4.5 Financial/Economic

Fiscal, taxation and spending practices among all three orders of government have many direct and indirect effects on Canada's urban regions. Through their effect on the market, they influence individual and business behaviour directly. Section 6 contains a description of several ways in which the federal government's taxation and expenditures influence efforts to promote urban sustainability. For example, the ability of large urban regions to implement a wide range of programs, from encouraging energy efficiency to reducing the growth of urban sprawl, is directly affected by the federal and provincial energy policies. In *Protecting the Environment and Reducing Canada's Deficit*, A. M. Gillies from the International Institute for Sustainable Development (IISD) wrote:

In the future, if Canadians are to achieve significant increases in energy efficiency, we will need consistent and sustained policies. Relatively small energy conservation programs are no match for the enormous influences which point in the other direction - the second lowest energy taxes in the world and subsidies to the energy sector estimated to be \$4 billion annually (IISD, 1993).

The nature of the scope of government intervention and the need for changes are described by Projet de Société in their draft *National Sustainable Development Strategy*. Projet's recommendations apply primarily to federal and provincial governments and include: the elimination of tax deductions that encourage the consumption of resources; eliminating tax deductions for advertising that promotes unsustainable lifestyles; ensuring that electricity prices reflect all environmental, social and economic subsidies; and transferring all subsidies of fossil and nuclear systems to conservation and decentralized renewable energy. A federal task force consisting of over 30 stakeholders from government, academia, environmental groups and industry was recently formed to examine federal economic instruments and disincentives to sound environmental practices and make specific recommendations for the next federal budget.

In addition to the elimination of government activities which distort the market, the application of full cost accounting is a critical component in promoting urban sustainability. Full cost accounting involves establishing monetary values that reflect the full environmental and social costs of an activity. There are a number of difficult

issues associated with progressing towards full cost pricing which involves government measures to influence prices to better reflect social and environmental costs. One of which is how to place a monetary value on matters such as community safety, health or natural resources, such as the preservation of natural spaces in urban areas or an old growth forest. These issues typically transcend any meaningful or agreed upon definition of monetary value. Attempts are being made, however, to establish monetary values in many of these areas. For example, several studies in West Germany on the social, economic and environmental impact of automobiles concluded that in the mid-1980's, the total costs ranged somewhere between DM 50 billion and DM 110 billion. Adjusting for population, this would amount to roughly \$30 billion for Canada in the 1990's. The social cost of private automobiles in West Berlin in 1985 was estimated at DM .65 per passenger-kilometer. To recover this cost from gasoline taxes would require prices on the order of \$5.00 per litre in Canada, or nine times the present price (Canadian Urban Institute, *Cities Without Cars*, 1991, in Roseland, 1992).

In its 1992 report, *Business Strategy for Sustainable Development: Leadership and Accountability for the 1990's*, the IISD concluded:

Some may view the introduction of a full cost pricing system as utopian, and indeed it will not happen easily. But if we are to take advantage of the efficiencies of the market system, and also move toward sustainable development, it is an effort that should be vigorously pursued.

Given the increasing globalization of business, significant progress toward full cost accounting and full cost pricing will require tremendous levels of international co-operation. Many countries will be reluctant to adopt full cost pricing measures if it will undermine their ability to maintain existing domestic and foreign capital investments or attract new sources of capital. Countries which do make progress toward full cost pricing are unlikely to do so without offering some level of trade protection to those sectors which are in competition with firms which continue to operate profitably through the erosion of the earth's natural capital assets and exploitation of labour. The Canadian Institute of Chartered Accountants and Ontario Hydro are currently Canadian leaders in the area of developing and full cost accounting measures for improved decision making. Little progress has been made on measures which promote full cost pricing.

4.5.1 Financial/Economic Challenges For Municipal Government

Municipal governments face a wide range of economic and financial challenges which

act as impediments to urban sustainability. The level of municipal government finances is often cited as an obstacle to establishing environmental programs which improve the level of urban sustainability. A typical concern among municipal politicians centres on the devolution of increasing environmental responsibilities from the provinces without the required increase in resources. In the ICURR sponsored survey, *Environmental Policy Review of 15 Canadian Municipalities*, 11 municipalities indicated that the lack of funds to meet new requirements as a result of federal or provincial legislative changes was a common obstacle to environmental program implementation. Eleven municipalities also cited a general lack of funding as an obstacle (Ouellet, 1993). Funding has also been cited as the principal cause for the deterioration of municipal infrastructure such as water treatment plants and roadways. A 1993 study funded by CMHC, *Trends in Municipal Finance*, identified a number of trends among seven cities concerning financing challenges. These include:

- Expenditures on hard services (water treatment, roads, bridges) have generally not grown as quickly as expenditures on soft services (education, and health) with the exception of water related infrastructure.
- Property taxes have not shown a dramatic increase and user-fees in all but two cities have increased as a percentage of municipal revenues.
- In the nineties, there has been a trend in provincial/municipal relations towards the downloading of provincial services to the local level and reduced provincial funding.

Not only is the level of municipal finances an important factor in urban sustainability, the source of revenues is also important. Municipal governments have limited taxation powers and have historically been restricted to property taxes in order to provide limited services. The connection between municipal taxes and service to property has become blurred in most jurisdictions over time. Given the development of regional municipalities and the proliferation of special bodies, few property owners understand the relationship between the costs of specific municipal services and municipal taxes. This situation makes it difficult for municipalities to utilize economic instruments to improve the operating efficiency of municipal services. For example, the absence of full cost pricing for municipal services such as water supply and treatment not only reduces general municipal revenues, but also contributes to inefficient consumption patterns. Research on municipal water use by Environment Canada has demonstrated that by linking the consumption of water to water rates through residential metering a reduction of 40 per cent is easily achievable.

In a related area, municipalities stand to save considerable operating revenues through the implementation of energy efficiency measures in their facilities. By

retrofitting existing facilities, municipal governments are able to profit by decreasing their energy consumption. Financing restrictions imposed through provincial legislation have been cited as an obstacle to the capitalization of these projects in Ontario (Brugmann, 1994).

Property taxes have been identified as a challenge to urban sustainability by a number of respondents interviewed for the Overview. Municipal government reliance upon property taxes varies. For example, property tax revenues account for 22.3 per cent of total revenues in British Columbia, 24.2 per cent in Nova Scotia; and 43.2 per cent in Ontario, where the provincial transfers account for only 37.3 per cent of municipal revenues (Kitchen, Slack, 1993). In 1992, the Ontario Round Table on the Environment and the Economy's, *Sectoral Task Force Report on Urban Development and Commerce*, stated:

The current municipal tax structure and revenue base has been identified as a barrier to achieving sustainable development. A more equitable system must be sought that would support the needs of both growing and declining communities. Both have a difficulty in meeting demands for infrastructural and operational costs. A new system should be based on quality not quantity. A long term initiative of the provincial government should be an examination of the municipal tax structure.

A number of specific issues were raised concerning the impact of municipal property taxes by interview participants. These include:

- The property tax system encourages competition for investment within large urban regions among municipal governments. Municipal governments that are more progressive in their efforts to promote urban sustainability may have to sacrifice a loss of investment as businesses seek to locate in areas with the lowest taxes and, in some cases, less expensive water and electricity. There needs to be a level playing field among municipal governments, even between those located in different provinces that border one another.
- Reliance on property taxes tends to emphasize the benefits of development and provide a disincentive to the preservation of natural areas or agricultural lands since they generate little municipal tax revenue. Hence, a municipal government with considerable undeveloped green space (which may be of regional significance) must bear a disproportionate cost of preserving this area by forgoing development.
- The current tax and revenue structure in some provinces promotes urban sprawl at the expense of more healthy and sustainable communities in the core. A variety of measures are required to preserve core cities in some jurisdictions.

- Reliance on property taxes derived from existing and new developments creates a situation in which the financial interests of the municipality may be similar to the interests of property developers. This may have a negative impact on municipal decision-making over land-use policies.

The overall impact of property taxes and other municipal financial structures on progress toward urban sustainability is a subject area which requires more detailed study and analysis. The issue of municipal finance is closely linked to the question of local government structure and authority. Effective governance for sustainability requires the establishment of policies which provide adequate financing powers for local governments in a manner which does not hinder the implementation of sustainable land-use practices on a regional scale.

"Despite the existing barriers to local sustainability planning, tremendous progress has been made. Communities have the potential to lead the way to a sustainable future."

Ron Doering, Executive Director, National Round Table on the Environment and the Economy, *National Round Table Review: Sustainable Communities*, Spring 1994.

5 INNOVATIVE POLICY DEVELOPMENTS: TOOLS AND STRATEGIES

As part of its commitment to developing a Overview for the OECD's Project Group on the Ecological Cities, Canada and other OECD nations were asked to identify their unique and innovative developments which would help to support international progress toward Ecological Cities through information exchange. Canada's innovative developments are outlined in some detail in this section in response to this request. They can also present Canadian policy makers with ideas and tools with which to begin to effectively address many of the root and meta-root challenges to urban sustainability described in the preceding section. While some of the tools described here are already widely in use, several are still in the early developmental stages, most notably State-of-Institutions Reporting and the Ecological Footprint/ Appropriated Carrying Capacity. Each however, shares the important attribute of potentially providing valuable assistance to those concerned with promoting urban sustainability in Canada and internationally.

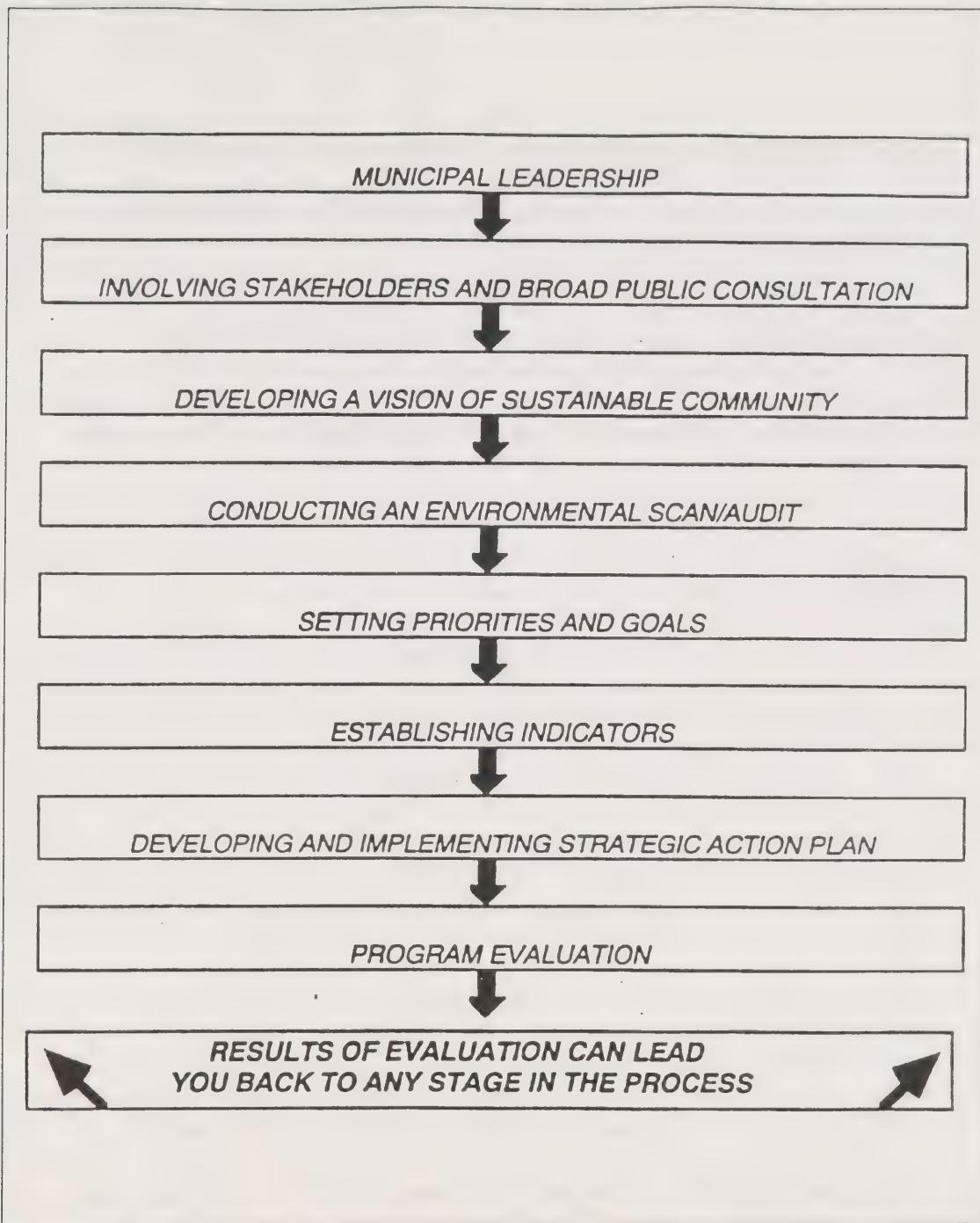
5.1 Strategic Approaches to Urban Development and Two Case Studies: The Greater Vancouver Regional District's *Creating Our Future* and The Regional Municipality of Hamilton-Wentworth's *Vision 20-20 The Sustainable Region*

A number of Canada's urban regions have begun the process of developing a strategic approach to developing urban sustainability. What follows is a generic outline of the strategic planning process and two examples of how this process may be applied. The common characteristics of the Strategic Planning Process were recently identified in the FCM/CCME's *A Municipal Primer on the United Nations Conference on Environment and Development* as follows:

- Municipal Leaders - To start the process a Tier 1 or Tier 2 municipality will have to take the lead, forming a planning group among the staff and councillors in order to facilitate and coordinate the process of developing the strategic plan.
- Stakeholder and Public Consultation - Stakeholders from a cross section of sectors and disciplines, particularly those with responsibility for implementing strategies, should be closely involved in the planning and implementation process. This may take the form of a local sustainable development council or local round table.
- Preliminary Vision of a Sustainable Community - This vision should emerge from the consultations and reflect the values of the community and its interpretation of what sustainability means.
- Environmental Audit/Scan - The vision provides a sense of where the community wants to go. The environmental audit/scan provides a picture of where the community is currently. An environmental scan is a term used by strategic planners that refers to an analysis of a community's internal strengths and weaknesses, and opportunities and threats to its external environment. The term environmental audit refers to an analysis of the symptoms and causes of environmental impacts. The term environmental audit/scan is used because the nature of sustainable development requires some work on both aspects. Information may be needed about the community's population, housing, income, solid waste, energy consumption, land-use patterns, and also about municipal jurisdiction, financial resources, organizational structure, and so on.

- Setting Priorities and Goals - The environmental audit/scan enables strategic issues to be identified. These are matters of central concern in achieving the vision and require urgent attention. To avoid paralysis, the operating principle in identifying strategic issues is focusing rather than being comprehensive, with a bias towards action. The decisions regarding focus are value laden and so should be made within the consultation framework to reflect the community's priorities. Issues selected should be used to refine the vision and to establish goals within a defined time frame with interim targets toward achieving goals.
- Evaluating and Monitoring Instruments - In gathering information about the environment, the environmental audit/scan will have revealed potential instruments that can be used to measure progress towards achieving specific targets. It is important that municipalities do not delay action because sophisticated evaluation instruments are too expensive or unavailable. An appropriate instrument may be as simple as going fishing. If certain local fish species have been identified as being particularly sensitive to pollution, then a regular count of that species may be a good indicator of overall water quality. More information on indicators is contained in Section 5.4.
- Strategic Action and Implementation Plan - Decisions have already been made regarding the priorities as to where the municipality wants to go (priorities and goals) and even how to measure progress (evaluation and monitoring instruments). At this stage the work is focused on action programs aimed at achieving goals. Each municipality's situation and priority decisions will dictate the types of action programs to be undertaken.
- Although the Strategic Planning Process has a clear starting point and specified outcomes, it is a somewhat circular and iterative process. The various components of strategic planning should reinforce each other and be re-visited on an ongoing basis. Figure 12 summarizes the components of strategic planning for sustainability and their inter-relationships.

Figure 12: Strategic Planning For Community Sustainability



Source: Canadian Council of Ministers of the Environment and the Federation of Canadian Municipalities, *A Municipal Primer on UNCED*, 1994

Greater Vancouver Regional District's (GVRD) *Creating Our Future*

While there are numerous examples of innovative efforts to develop strategic plans, the exceptionally rapid growth in the Metropolitan Vancouver Region has led to comprehensive and innovative efforts to manage the growth of urbanization while preserving a 'Green Zone' of natural and agricultural areas. In 1990, after considerable community consultation, the Board of the GVRD adopted *Creating Our Future*, a long range plan with specific policies to manage future urban growth and promote sustainable transportation over the Metropolitan Vancouver Region. This area is one of the fastest growing regions in North America with an expected 70 per cent increase in population, to 3 million people, by the year 2021. In British Columbia, regional government land-use and transportation planning mandates do not override municipal planning and zoning authority. Hence, the successful implementation of the *Creating Our Future* relies on the voluntary co-operation of 18 member municipalities within the region.

Creating Our Future and the subsequent report, *Livable Region Strategy: Proposals*, consist of a broad set of principles, strategies and operational policies covering issues from the growth of urbanization and air quality, to solid waste reduction and transportation planning. Selected regional planning goals established by the GVRD include: reducing air emissions by 50 per cent, relative to 1985 by the year 2000; growth targets to establish a more compact metropolitan region with a focus on intensification and improving the jobs/residence ratio in four sub-areas (Vancouver, Burnaby and New Westminster; the North East Sector; and North Surrey and North Delta); and a focus on building affordable, moderate density ground-oriented residences close to jobs, services and other existing amenities.

Transportation planning was developed from the principles in these documents. The GVRD Board has adopted the principle that: "The region will give priority to walking, cycling, transit, goods movement and then private automobiles". In co-operation with the province of British Columbia, the GVRD has developed medium and long range transportation plans for greater Vancouver. These establish integrated transportation plans, with associated policies, demand management measures and priorities for transportation investment for the years 2006 and a vision of a transportation system for 2021. The transportation plans have been designed to reinforce the growth targets established in the *Livable Region Strategy: Proposals*, by controlling investments in a manner which will help to shape land-use. The four levers to achieve the goals of the long range and medium range plans, to be used simultaneously, include: controlling land-use; adjusting transport service level; applying transportation demand management; and supplying transport capacity. Selected conclusions and recommendations from the report, *A Medium-Range*

Transportation Plan for Vancouver, include:

- Where governments make transport investments aimed at helping to shape land-use, they should be aware that the strength of the shaping effect is not well-understood.
- Despite this uncertainty, transport investments should be made within the medium-range horizon with a goal of shaping land-use.
- The land-use shaping effects of transportation improvements mean that governments should give priority to those investments which improve the accessibility of the inner suburbs to and from each other, as opposed to making early improvements to accessibility for longer distance commuting.
- Governments should not make transportation investments ahead of municipal land-use plans and other supporting initiatives, but should dovetail transport investment and land-use plans.
- A program of public education and incentive measures should precede the introduction of disincentives such as bridge tolls, gas taxes and parking management. Incentives introduced early should be:
 - promotion of telecommuting, van pooling, a computerized match-up program for car-poolers, and programs to support employers in reducing vehicle trips to their work sites,
 - bus priorities on the street and high-occupancy vehicle privileges,
 - measures to give workers with free/subsidized parking the opportunity for receiving this employment benefit in cash or as a transit pass; moves to "pay as you drive" vehicle insurance allowing those who drive less to realize savings on their premiums.
- Tolls and taxes, which are revenue-generating measures, should be clearly dedicated to transportation improvements to improve the acceptability of the measure to the public.

The medium range transportation plan includes specific targets to measure success. These include measurements of: the number of kilometers driven by all vehicles annually; percentage of roads badly congested at rush hour; emissions from motor vehicles (tons per year of five atmospheric pollutants); transit's share of travelers in

the morning rush hour, region wide; and the number of people bicycling to work in the region each day. The GVRD's efforts to recognize the nature of this relationship and respond in a comprehensive manner should greatly increase its chances of improving the liveability of that region. Even given the innovative nature of the transportation plan, it has come under some criticism because the overall impact of its successful implementation will result in a significant net increase in the number of private automobiles in the GVRD.

The adoption of *Creating Our Future* initiated a public consultation process to establish a Green Zone in the region which is to be protected from further urbanization. This work is based on the principle: "The region will manage its growth to preserve green areas, provide regional parks and open space, maintain farming and contain urban sprawl." The development of the 'Green Zone' involved all of the GVRD's 18 municipalities and the public in two region-wide conferences held in 1991. As a result of this process, *Creating Vancouver's Green Zone, The Livable Region Strategic Plan* was developed. It identifies four categories of Green Zone for protection:

- Community Health Lands, including watersheds, flood plains and hazards lands.
- Ecologically Important Lands, including forested mountain slopes, wildlife habitat, wetlands, and key green areas that support the integrity and stability of regional ecosystems.
- Outdoor Recreation and Scenic Lands, including major parks and recreation areas, and key green areas that are essential to the scenic vistas and visual character of Greater Vancouver.
- Renewable Resource Lands, including agricultural and forestry lands.

These places encompass an area almost two-thirds of the regional land base. Individual municipalities have identified their Green Zone areas and will be responsible for protecting them from further urbanization. The GVRD does not have the legislative authority to force municipal compliance in protecting Green Zones. However, in partnership with a number of non-government organizations who are concerned about protecting these areas from further urbanization the GVRD plans to provide various forms of assistance to municipal governments. The development of urban containment policies to control the spread of urbanization and the integration of the Green Zone Areas into the Official Plans of member municipalities are key implementation measures now underway. A variety of

initiatives undertaken by the province of British Columbia, municipal governments, the federal government, intergovernmental organizations such as the Fraser Basin Management Program and non-governmental organizations will help to support the implementation of the development of regional parks and the protection of Green Zones in this rapidly growing urban region. The Green Zones, in addition to preserving the liveability of the region, will provide further incentives to achieve the transportation and compact form targets in the long term strategy.

Regional Municipality of Hamilton-Wentworth's *Vision 2020 - The Sustainable Region*

Within Canada, Hamilton-Wentworth has endured the reputation of a dirty, heavily industrialized area with all the accompanying problems of pollution, labour difficulties and economic struggles. Yet Hamilton-Wentworth has made considerable progress recently in its pursuit of developing a high quality of life for its citizens based upon principles of sustainability. *Hamilton-Wentworth's Vision 2020 - The Sustainable Region*, is a sustainable development strategy for the region developed in direct consultation with over 1,000 people through a series of community town hall meetings and focus groups managed by a citizens' task force. In 1989, the Regional Chairman created a Task Force on Sustainable Development which worked over a three-year period to develop the Vision 2020 report and two additional documents, *Directions for Creating a Sustainable Region* and *Detailed Strategies and Actions for Creating a Sustainable Region*. Together these include over 400 recommendations on actions to be taken by the regional municipal government, other orders of government, community groups, businesses and individual citizens. These documents address goals and actions in a broad range of areas which include air quality; water resources; energy efficiency; land-use in urban areas; public education; community empowerment; transportation modes; and the local economy for the entire region.

The Regional Council has made a commitment to use sustainable development as a guiding philosophy in all decision-making and long term policy documents. The Regional Official Plan, the Community Economic Development Strategy, the Regional Transportation Review, and the Health and Social Services Master Plan are all currently being revised to reflect the work of the Task Force.

In recognition of its work, in October, 1993 Hamilton-Wentworth was formally recognized as the first municipality to participate in the International Council for Local Environmental Initiative's (ICLEI) Local Agenda 21 Model Communities Programme. ICLEI, the Federation of Canadian Municipalities and Hamilton-Wentworth signed a Memorandum of Understanding that will promote collective activities over two years to ensure the successful implementation of Vision

2020. These include: establishing budgeting procedures or process reforms to factor in sustainability and reflect the intent of Vision 2020; and developing and testing mechanisms and tools to increase the accountability of the regional municipal government, its residents, and resident institutions to the implementation of Vision 2020. Increased accountability can be accomplished through, for example, establishing community sustainability indicators; developing and testing a 'report card' process as a means to monitor progress; and to link the annual report card process with the budgetary process of the Municipality. Programs are also being developed to build on and enhance community involvement in implementing Vision 2020.

If everyone on earth lived like the average Canadian, we'd need at least three Earth's to provide all the material and energy essentials we currently use.

Mathis Wackernagel, How Big is Our Ecological Footprint?, University of British Columbia's Task Force on Healthy and Sustainable Communities, 1993.

5.2 The Ecological Footprint/Appropriated Carrying Capacity Concept

For several years Professor William Rees and his students at the University of British Columbia's School of Community and Regional Planning have been developing a policy assessment tool that measures the aggregate ecological impact of human economic activity. Appropriated carrying capacity and "ecological footprint" analysis enables policy makers (or NGOs) to estimate human impacts in terms of the effective land/ecosystem area required to support a given pattern and quality of consumption (Rees, 1992; Rees and Wackernagel, 1994; Wackernagel et al., 1994). Since 1991, this research has been focussed and applied at the municipal level through the University's Task Force on Healthy and Sustainable Communities.

Since every major category of human consumption or waste discharge requires the productive or absorptive capacity of a finite area of land or water ecosystems, according to Wackernagel:

Adding up the land requirements of all these categories gives us an aggregate or total area which we call the "ecological footprint" of the economy on Earth. This area represents the carrying capacity "appropriated" by that economy from the total flow of goods and services provided by the ecosphere. The ecological footprint can therefore also be called the appropriated carrying capacity of the economy. The Ecological Footprint(EF), or Appropriated Carry Capacity (ACC) is defined as the aggregate land (and water) area in various categories required by the people in a region:

- a) to provide continuously all the resources they presently consume, and,
- b) to absorb continuously all the waste they presently discharge using current technology (Wackernagel *et al.*, 1994: 7,10).

The EF/ACC is like an 'ecological currency'. It is to sustainability analysis what the dollar is to economic analysis. EF/ACC can be applied to any level of analysis, be it the household, a city, an urban region or a nation to determine the relative ecological impact of an activity. For example, each Canadian currently consumes the equivalent of 2.34 hectares of land for fossil energy alone each year. The 1.7 million inhabitants of lower Fraser Valley in British Columbia, require a land area which is 18 times the existing area of 4,000 square km in order to maintain existing levels of consumption (22,000 square km for agriculture, 8,000 square km for forestry and 40,000 square km for energy and CO₂ absorption). (Wackernagel *et al.*, 1994). Inhabitants in the Netherlands consume less resources *per capita* than Canadians and share similar population densities to the Fraser Valley, but consume only 13 times their land base in food, forestry and energy resources alone. Hence, urban regions which have a lower Ecological Footprint/Appropriated Carrying Capacity may be said to be closer to the ideals of the Ecological City, than those which require larger land areas to sustain their levels of resource consumption and absorb wastes. The EC/ACC concept can be used to measure the relative extent to which development in an urban region is reducing or increasing its *per capita* demands on the carrying capacity of the ecosphere.

EF/ACC may also be used to compare the relative ecological impact of different technologies. According to the EF/ACC model, in one year, a person travelling 10 kilometers each day to work by bicycle will require 125 square meters of ecologically productive land; 380 square meters if travelling by bus, or 1870 square meters if travelling by car. The calculations for these figures include a variety of ecological impacts associated with transportation such as the loss of land for road construction and the consumption of energy and resources for the manufacturing of automobiles. Energy consumption data may be converted into land area in a number of different ways. The EF/ACC uses a conservative measure which converts energy consumption into the ecologically productive land required to sequester the according CO₂ production.

While the EF/ACC is not a completely accurate assessment of the land required to engage in a particular activity, it does illustrate the relative magnitude of the impact of human activities on nature's carrying capacity. As long as the same figures are used it can be a common 'sustainability yardstick' with which to compare the relative merits of various policy options. The EF/ACC represents an important tool for promoting sustainability since it has a number of policy and decision-making applications. These include, but are not limited to:

- Providing a much needed balance to the traditional monetary, cost-benefit analysis by establishing a single measurement for a complex range of ecological variables, namely the natural capital requirements for given human activities.
- Measuring the resource intensity of new technologies or patterns of development versus alternatives.
- Measuring the resource intensity of specific policies among all orders of government and internationally.
- Providing the basis for an analysis of social equity issues.
- Providing an indicator of the relative resource consumption intensity of different lifestyles within a particular urban region and the extent to which its inhabitants are consuming resources at a non-sustainable rate. Hence, it may also be used to assist in programs to educate urban dwellers if it is integrated into State-of-Environment Reporting frameworks (see Section 5.4).

The EF/ACC model has been developed in a manner which allows municipal governments to calculate the magnitude of their ecological footprint based on municipal statistics on income distribution and the standardized consumption/land-use matrix for Canadians. The EF/ACC is in preparation to become part of the policy for reporting the sustainability implications of development applications in the City of Richmond, British Columbia.

5.3 State-of-Institutions Reporting Framework

The Fraser Basin Management Board commissioned a study in 1993 to develop a framework and set of criteria for evaluating institutional performance related to implementing the Fraser Basin Management Program; and to design an approach for developing a State-of-Institutions report. *A Framework for State-of-Institutions Reporting* by H. Rueggeberg and J. Griggs contains an approach to State-of-Institutions (SOI) reporting described below. SOI reporting remains a relatively new conceptual tool which has not yet been utilized in Canada, although there are related evaluative exercises undertaken, for example, by federal and provincial Auditor Generals. Given the fact that governance institutions are increasingly recognized as representing challenges to urban sustainability, SOI reporting offers a means of promoting institutional evolution toward forms more conducive to achieving progress. Regular SOI reporting may serve four principal functions relating to urban sustainability and enhancing institutional evolution. These include:

- Providing information to those living in urban regions about where management responsibilities lie and how to readily understand the existing institutional frameworks.
- Identifying specific issues of concern about the way governance is being carried out.
- Evaluating the institutional systems for its ability to provide leadership and direction in achieving sustainability.
- Generating ideas and recommendations for improvements, thereby assisting in the evolution of the institutional system to meet the goals and challenges of sustainability.

After establishing a system for describing the institutional frameworks in both general and detailed terms, SOI reporting may involve evaluating the entire system, or its components. Thirteen criteria have been identified as the basis from which to evaluate the current characteristics of the institutional system, in terms of its level of support for sustainability. An evaluation of this nature is based on values and opinions rather than objective measurements and may not be suitable for specific situations, however, it does offer a solid starting point from which to build support for sustainability into existing institutional frameworks. An ideal institutional system for sustainability would likely display the following characteristics:

Integrated and Co-ordinated

- Integrative: each part of an institutional system interprets its mandate broadly to take all three dimensions of sustainability (social, economic and ecological) into account.
- Comprehensive: each part of the institutional system recognizes all values associated with the resources it addresses and/or services it delivers. It employs the principle of 'full cost accounting' in assessing the outcomes and impacts of decisions.
- Co-ordinated and transactive: each part of the institutional system recognizes linkages with other parts of the system, seeks to harmonize its activities and those of others, and promotes a co-ordinated approach to achieving overlapping objectives.

Efficient and Effective

- Efficient: the institutional system seeks to reduce overlaps and redundancies in the mandates and activities of its component parts; two or more parts of the system do not duplicate efforts. This criterion recognizes that some degree of overlap is necessary to support integration and to ensure the 'robustness' of the system in being able to respond to unexpected events.
- Effective: each part of the institutional system has a sufficient mandate and the required level of staff and resources to run processes, make decisions, implement results, and monitor or review outcomes as necessary to achieve its objectives. The operation of the system produces meaningful results from the perspective of those operating in the system, as well as recipients of services provided by the system.

Long Term and Adaptive

- Strategic and anticipatory: the system is perceptive, looking for present and future opportunities and challenges. It establishes priorities to take action based on an assessment of the scope of impacts, irreversibility of decisions or actions, and urgency; in addition, it has the capacity to address short-term crises, undertake long-term planning, and also anticipate and respond to issues which occur at 'in-between' speeds.
- Precautionary: the institutional system recognizes that social, economic and ecological limits exist, though they may not be definable. It takes a cautious approach to solving problems and making decisions to ensure that outcomes are within those limits.
- Reflective and adaptive: the institutional system has the capacity to keep up with changing values and knowledge, and to review and improve decision-making processes. It has the mandate and tools required for self-evaluation and self-modification. It shows leadership not only in questioning the way things are done, but whether in fact the right things are being done. This is not just a latent capability but an active role.

Open, Balanced and Fair

- Representative: each part of the system provides opportunities for all affected interests to be represented in processes, decisions and/or actions.

- Equitable: the system ensures that the costs and benefits of decision-making processes, and their outcomes, are distributed fairly among those affected, providing compensation for those negatively affected, and providing appeal mechanisms for those who feel that their interests have been overlooked or undermined.
- Participatory and collaborative: the institutional system provides appropriate opportunities for individuals and groups representing different interests to cooperate in decision-making and take actions which affect their future while sharing responsibility for outcomes.
- Responsive and accountable: each part of the system responds in a timely fashion to the constituency it serves and provides mechanisms by which individuals or groups can be held responsible for a decision or action directly by that constituency; these mechanisms are not so rigid as to inhibit creativity.
- Conflict-resilient: the system provides mechanisms to deal constructively with conflicts within and between its component parts, and with other institutional systems.

A critical factor in achieving future success with SOI reporting will undoubtedly involve reaching consensus on the importance and precise nature of these criteria within a given institutional system. SOI reporting may then be used as the basis from which to conduct external institutional audits; internal institutional evaluations; and to identify further improvements in institutional integration and co-ordination. SOI reporting, while in its infancy, holds much promise in furthering the development of institutions which support and promote measures to increase urban sustainability.

"There is a growing recognition of the need to change decision-making processes in order to achieve a better balance between ecosystem and human system considerations. One component of this change focuses on developing a system of reporting in order to measure ecosystem and human health."

Douglas Burch, Municipal Reporting and Sustainable Development, National Round Table on the Environment and the Economy, 1994.

5.4 State-of-Environment Reporting and State-of-the-City Reporting

A variety of reports are now being utilized by all orders of government to monitor

the current status, trends and changes in the condition of the environment and human health, as well as to increase awareness of these issues. In larger measure, this is due to the fact that traditional indicators do not adequately reflect sustainability. One form of reporting common to municipal governments is State-of-Environment Reports (SOER's). SOER's have been defined by Environment Canada as: a selection of indicators that provide a general overview of environmental conditions from which progress in dealing with environmental issues can be inferred through systematic measurement, collection, and publication of environment and resource data focusing on the interaction between human activity and the environment. A wide variety of methodologies for SOER have been developed. Other types of reports, such as Quality of Life Reporting, State of the City Reporting, and Sustainable Development Reporting have also been developed by various orders of government to serve a number of similar purposes.

Canada produced its first SOER in 1986 and established a formal State-of-Environment reporting program under the administration of Statistics Canada and Environment Canada in 1988. Health and Welfare Canada and the National Health Information Council have actively been researching indicators on human health and quality of life. A number of provinces, including Quebec, Manitoba, Saskatchewan and British Columbia have produced SOERs, while the provinces of Ontario and Alberta are currently developing them. According to data obtained through the CURE, 31 municipalities have completed some form of environmental report, 25 are preparing them, and 57 are under consideration. Municipalities which have completed such reports include but are not limited to: the Regional Municipality of Ottawa-Carleton; the Regional Municipality of Waterloo; the City of Toronto; the City of Vancouver; the City of Burnaby; the City of Ottawa; the City of Saint John; the City of Regina; Quebec City; and the City of Calgary.

The function of SOE reporting varies among governments, but generally consists of one or more of the following:

- To provide the public with information.
- To act as a basis for comparison.
- To improve decision-making.
- To evaluate the effectiveness of policies and programs.
- To measure progress towards sustainable development.

- To make recommendations for new or improved programs or policies.

No consensus currently exists on the most appropriate structure and content of SOER factors which greatly influence the overall ability of the reports to perform the aforementioned functions. In *Towards New Fundamentals: Indicators of Ecologically Sustainable Development*, developed by the Canadian Environmental Advisory Council, Ruitenbeek identified five new fundamentals for the next generation of indicators to support sustainable decision-making. These are that indicators should:

- Reflect a broader scope - the economy and human behaviour within it should be acknowledged as a subset of the broader ecosystem which supports them.
- Reflect distributive elements which are important from a social equity viewpoint - incidence of both costs and benefits of environmental degradation on various income and interest groups, for example, should be explicit.
- Have applications as a forward looking projective tool rather than just a descriptive tool for monitoring current or past conditions.
- Reflect explicit linkages between human economic behaviour and the degree of vigour and productivity in the broader ecosystem.
- Recognize the inherent uncertainty in ecosystem behaviour and response.

As part of its as yet unpublished *Environmental Indicators for the City of Toronto*, the Canadian Urban Institute has proposed five characteristics for viable urban environmental indicators that build on the aforementioned principles. These are that they be:

- Useful. The indicator must tell us something about the state of that aspect of the environment we wish to measure. Both the aspect of the environment and the indicator must be relevant.
- Understandable. The indicator must be accessible to a general audience, i.e. comprehensible.
- Acquirable. The indicator must be measurable at a reasonable cost and with reasonable ease.
- Credible. The collection methodology for the indicator must be repeatable and scientifically defensible as far as possible.

- Local. The indicator must reflect the local state of the environment.

These principles represent some recent efforts to establish an acceptable and commonly utilized approach to the use of indicators in Canada. State-of-the-City Reporting represents the application of some these principles. A State of the City report was completed by the City of Toronto in 1993. It has a variety of indicators on the quality of social, physical and economic environments within the city and focuses on the various interrelationships between them. The report covers matters in areas such as the environment, housing, transportation, education, safety, community health and economic life. The interrelated nature of the different components is summed up in the document as follows:

Community health involves more than the health of individual Torontonians because it includes the well-being of our built and natural physical environments, as well as our social, political, economic and cultural circumstances. This is called the "socio-environmental approach" to health, since it focuses on high risk conditions, rather than just high risk individuals or groups (City of Toronto, State-of-the-City Report, 1993).

It is recommended in the State-of-the-City report that future reports be conducted every three years, in order to evaluate the successfulness of measures which have been implemented to address specific challenges described in the current report.

The increasing utilization of SOER reporting and State of the City reporting is a positive trend which continues to hold much promise. The development of common theoretical foundations for urban sustainability indicators utilized in these reports is critical to ensure the successful development and application of decision-making tools which reflect the integrated nature of the social, economic and ecological dimensions of urban sustainability.

5.5 The Ecosystem Approach to Land-Use Planning

An ecosystem approach to planning is an attempt to more fully integrate environmental considerations into the process of planning and development - to establish support for the third leg of urban sustainability and healthy communities described in Section 1. Traditional planning and land-use legislation has addressed its social and economic implications, but placed little or no value upon the cumulative environmental impacts of development. The lack of integration of ecological considerations in land-use planning is viewed as a formidable challenge to the development of urban sustainability. The Ecosystem Approach to public

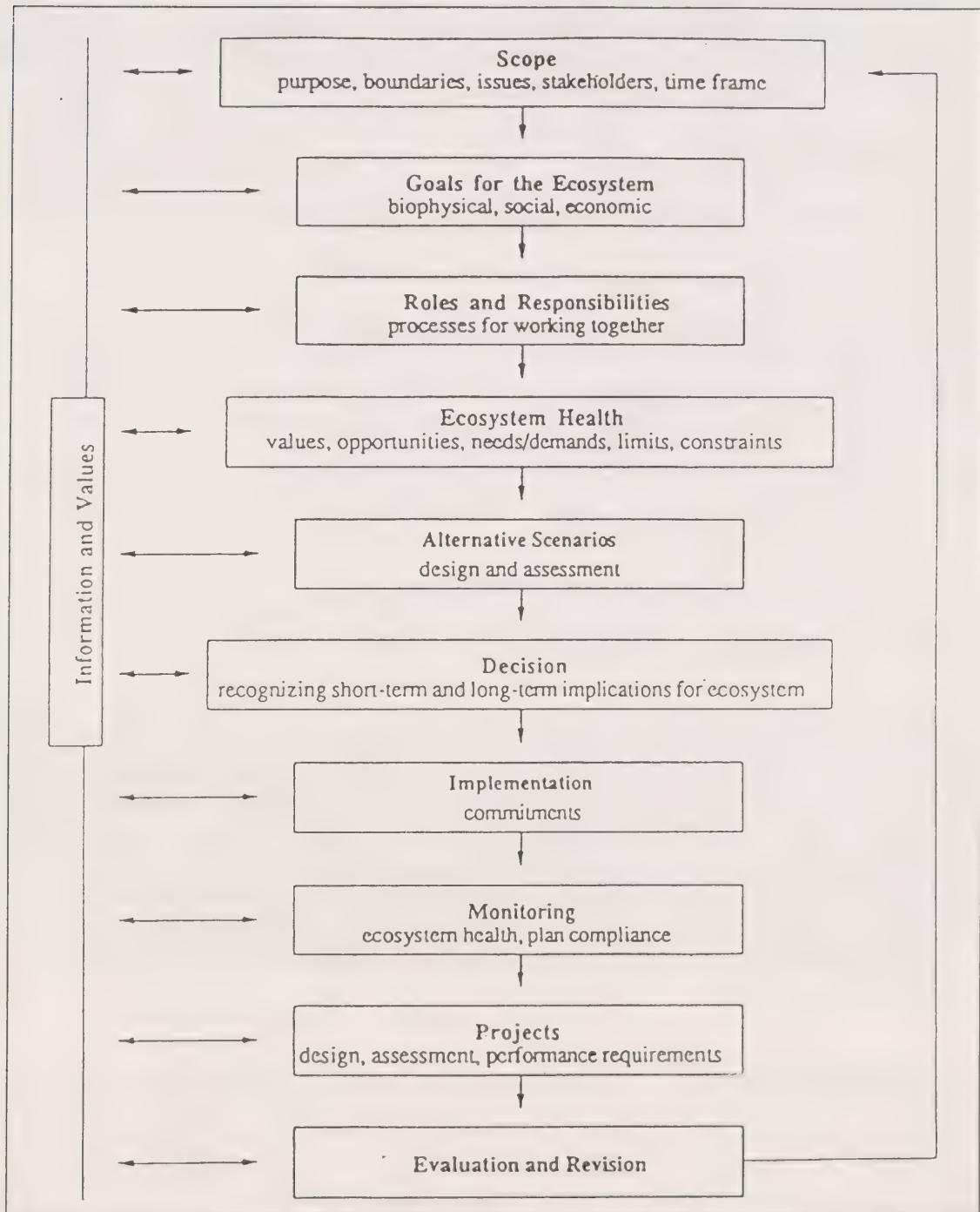
policy has been developed and implemented over the last five years by the Royal Commission on the Future of the Toronto Waterfront (RCFTW), and the International Joint Commission. In *Planning for Sustainability*, the RCFTW described a number of principles which were recommended for all levels of land-use decision making - policy, plan, program and project. These guiding principles, which are derived largely from the general ecosystem approach, include the following:

- Environmental values should be given a higher level of priority than in the past.
- Rather than trying to fix problems after damage is done, active efforts should be made to improve environmental quality and anticipate and prevent environmental damage.
- There should be a systematic investigation, analysis, and integration of information about the existing physical, natural and heritage environments. In addition to special features and resources, this should include the relationships among them: systems, connections, processes.
- A thorough understanding of the environment, including the values, opportunities, limits, and constraints that it provides, should precede and guide land-use decisions.
- Different scenarios for change that are part of developing official plans should be evaluated, using ecosystem-based criteria. The nine *Watershed* principles (see Section 7.5.4), may be useful in developing such criteria (clean, green, usable, diverse, open, accessible, connected, affordable, and attractive). Evaluation should also include an assessment of the possible cumulative effects of different courses of action, and consideration of targets and goals for monitoring and ensuring compliance with policies and plans.
- Proposed development should receive some form of environmental evaluation, recognizing that every decision to develop or redevelop land involves a decision about the environment. The environmental evaluation should be designed to reflect the nature and scale of the proposed activity.

- The intrinsic values of the environment should be recognized: for example, the land is valuable in its natural state and not simply raw material for ultimate urbanization.
- Development should accommodate and respect its environmental context. In some places, this may lead to an absolute prohibition on development. In others, it will lead to careful consideration of how development is carried out.
- Natural areas such as woodlands and wetlands should not be treated as "islands of green" but as integral parts of the whole landscape. Efforts should be made to establish links and corridors, and to promote remediation or replacement where damage has occurred. Measures should also be included to enhance environmental features.
- To the extent possible, planning efforts should encompass ecosystem-based units such as watersheds.

Figure 13 illustrates the sequence of elements involved in ecosystem-based planning. This process was developed by Suzanne Barrett and Kate Davies. It should be seen as part of an iterative process in which information from each step may be used to modify previous steps.

Figure 13: A Framework for Ecosystem Planning



The basic elements of the ecosystem-based planning process illustrated in Figure 13 are as follows:

- Defining the scope of a plan: the need for it, the geographic area to which it refers, who should be involved in the plan, the time it will take to complete, and the key issues to be addressed.
- Defining goals.
- Defining the roles and responsibilities of the participants.
- Assessing ecosystem health, limits, and values.
- Designing and assessing alternative scenarios.
- Reaching fair and useful decisions.
- Deciding how those decisions will be implemented.
- Monitoring implementation.
- Ensuring that projects comply with plans.
- Evaluating and revising plans.

While the adoption of an ecosystem-based approach to land-use planning will not, in and of itself, result in the formation of ecological cities, the integration of ecological concepts is a critical element. According to data obtained from CURE, there are a number of municipal governments in Canada which have begun to adopt ecological approaches to planning, tailored to their local or regional circumstances. Table 9 illustrates the various types of geographic boundaries chosen to establish the scope of ecosystem planning exercises. Given that ecosystem planning is a relatively new model which often requires a high degree of intergovernmental co-operation, the application of the ecosystem concepts described above varies considerably among municipalities.

Table 9: Ecological Approaches to Planning By Geographic Scope Among Municipal Governments, 1994

Approach	Implementation	
	Yes	Planned
Airshed	9	7
Watershed	71	13
Wetlands	54	12
Waterfront/Harbour	44	5
Regional Environment	54	10
Ecosystem	36	8

Source: *CURE*, 1994

Elements of the ecosystem-based approach to land-use planning have recently been enacted by the Province of Ontario in its reform of land-use and planning legislation entitled, *An Act to revise the Ontario Planning and Development Act and the Municipal Conflict of Interest Act, to amend the Planning Act and the Municipal Act and to amend other statutes related to planning and municipal matters*. The province of British Columbia's Commission on Resources and Environment has introduced *A Sustainability Act for British Columbia*. The second volume, *Planning for Sustainability*, addresses a broad range of land-use planning issues in an effort to improve the level of efficiency and more fully integrate the environment into the decision-making process. The Waterfront Regeneration Trust continues to develop and modify this approach in its work across the Greater Toronto Area bioregion.

"Strategies should be understood as both process and product. How the strategy is developed is almost as important as the contents of the strategy itself, as the means of development generate buy-in of the partners who will put the strategy elements into effect."

Kumar, Manning, and Murk, 1993.

5.6 Integrative Processes - Consensus Building

Integrative processes which allow for the development of innovative solutions, while building trust and partnerships among diverse groups, are critical to overcoming institutional and perceptual barriers which have been established along economic, social and environmental divisions. The establishment of sustainable urban regions requires the reconciliation of a broad number of often competing interests. Since the

establishment of the National Round Table on the Environment and the Economy in 1987, thousands of Canadians have taken part in consensus processes at all stages in the decision-making process, from the establishment of comprehensive community development plans and policies, to the settlement of local development conflicts. Although consensus processes are not suitable for many of the issues confronting society by the challenge of establishing ecological cities, these processes continue to be effectively utilized to resolve a variety of complex environmental, social and economic conflicts. Consensus processes, if properly employed, are capable of generating creative and lasting solutions to the challenges inherent in achieving sustainability by bringing a diversity of knowledge, experiences and resources to the table.

While Canadians are not the originators of consensus processes, their application in a wide variety of situations has led to a number of insights into the process. The following is a brief synopsis of a document, *Building Consensus for a Sustainable Future: Guiding Principles*, completed in 1993 by the Canadian Round Tables, the Canadian Standards Association, the International Institute for Sustainable Development and the Niagara Institute. It describes general guidelines on when to use a consensus-based approach and how to embark on the consensus process.

*A consensus process is one in which all those who have a stake in the outcome aim to reach agreement on actions and outcomes that resolve or advance issues related to environmental, social, and economic sustainability. Participants work together to design a process that maximizes their ability to resolve their differences. Although they may not agree with all aspects of the agreement, consensus is reached if all participants are willing to "live with the total package." Consensus processes do not avoid decisions or require abdication of leadership - but call upon leaders to forge partnerships that work toward developing solutions. A consensus process provides an opportunity for participants to work together as equals to realize acceptable actions or outcomes without imposing the views of one group or authority over another. There are many forms that a consensus process can take. Each situation, issue or problem prompts the need for participants to design a process specifically suited to their abilities, circumstances and issues (Canadian Round Tables, *Building Consensus for a Sustainable Future: Guiding Principles*, 1993).*

Canadian experience with consensus decision-making maintains that the process should be participant determined and driven, reflecting the needs of their interests and the issues of a given situation. The following is an abbreviated version of the guiding principles of a consensus process:

Principle #1 - *Purpose Driven*: *People need a reason to participate in the process.* They should have a common concern and believe that a consensus process offers the best opportunity for addressing it. This requires both an informed understanding of the consensus process and a realistic view of the available alternatives.

Principle #2 - *Inclusive not Exclusive*: *All parties with a significant interest in the issues should be involved in the consensus process.* Care needs to be taken to identify and involve all parties with a significant interest in the outcome. This includes those parties affected by any agreement that needs to be reached, those needed to successfully implement it, or who could undermine it if not included in the process. When decisions require government action, the appropriate authorities should participate.

Principle #3 - *Voluntary Participation*: *The parties who are affected or interested participate voluntarily.* The strength of a consensus process flows from its voluntary nature. All parties must be supportive of the process and willing to invest the time necessary to make it work. The possible departure of any key participant presses all parties to ensure that the process fairly incorporates all interests. A consensus process may complement other processes. If that process fails, participants are free to pursue other avenues.

Principle #4 - *Self Design*: *The parties design the consensus process.* All parties must have an equal opportunity to participate in designing the process. There is no 'single' consensus process. An impartial person, acceptable to all parties, can be an important catalyst to suggest options for designing the process, but the ultimate control over the mandate, agenda and issues should come from the participants themselves.

Principle #5 - *Flexibility*: *Flexibility should be designed into the process.* It is impossible to anticipate everything in a consensus process. By designing flexibility into the process, participants can anticipate and better handle a challenge when it faces them. A consensus process involves learning from the perspectives of all participants. Feedback must, therefore, be continually incorporated into the process. The initial design may evolve as the parties become more familiar with the issues, the process, and each other.

Principle #6 - Equal Opportunity: All parties have equal access to relevant information and the opportunity to participate effectively throughout the process. Unless the process is open, fair and equitable, agreement may not be reached, and if reached, may not last. Not everyone starts from the same point - particularly in terms of experience, knowledge and resources. To promote equal opportunity, consideration needs to be given to providing: training on consensus processes and negotiating skills; adequate and fair access to all relevant information and expertise; and resources for all participants to participate meaningfully.

Principle #7 - Respect for Diverse Interests: Acceptance of the diverse values, interests, and knowledge of the parties involved in the consensus process is essential. A consensus process affords an opportunity for all participants to better understand each other's diverse values, interests, and knowledge. This increased understanding fosters trust and openness which invaluablely assists the participants to move beyond bargaining over positions to explore their underlying interests and needs. Reaching a long lasting consensus agreement involves exploring and developing common interests despite differences in values.

Principle # 8 - Accountability: The participants are accountable to both their constituencies and to the process that they have agreed to establish. It is important that the participants representing groups or organizations effectively speak for the interests they represent. Mechanisms and resources for timely feedback and reporting to constituencies are crucial and need to be established. This builds understanding and commitment among constituencies and minimizes surprises. Given the significant public concern about environmental, social and economic issues, keeping the public informed on the development and outcome of any process is important.

Principle #9 - Time Limits: Realistic deadlines are necessary throughout the process. Clear and reasonable time limits for working towards a conclusion and reporting on results should be established. Such milestones bring a focus to the process, marshal key resources, and mark progress towards consensus. Significant flexibility, however, is necessary to embrace shifts or changes in timing.

Principle # 10 - Implementation: Commitment to implementation and effective monitoring are essential parts of any agreement. Parties must be satisfied that their agreements will be implemented. As a result, all parties should discuss the goals of the process and how results will be handled. Clarifying a commitment to implementing the outcome of the process is essential. The support and commitment of any party for follow-up is critical. When decisions require government action, the participation of government authorities from the outset is crucial.

A post-agreement mechanism should be established to monitor implementation and deal with problems that may arise. The four basic steps in a consensus process are:

- Assessment - *Talking About Whether to Talk*: Since not all situations are appropriate for using a consensus process a number of questions should be asked before deciding to proceed. These include: Is there a reason to participate in this process? Can the subject matter be addressed at this time? Can progress be made or issues negotiated? Can the major interests be identified? Are there representatives who can speak for these interests?
- Getting Started - *Talking About How To Talk*: Involves identifying the interests and the appropriate participants to represent those interests and designing a process. Initial steps in designing a process include: establishing clear objectives; defining what will constitute a consensus for reaching an agreement; structuring how the process will work - including meeting formats, working with subgroups, caucuses, resource requirements, and ground rules; establishing protocols on attendance, confidentiality and the sharing of information; and agreeing on a schedule of milestones.
- Running the Process - *Talking*: In this step, the participants should focus on building consensus by: discussing issues; focusing on issues rather than personalities; genuinely listening to each other's perspectives on these issues; reaching agreement on principles around issues and exploring what these mean in practice; developing an action plan for building an agreement; recording agreements as they are reached. This step proceeds according to the ground rules established in the previous stage.
- Implementing and Monitoring the Results - *Turning Talk into Action*: Several key features of implementing a consensus agreement include: establishing who is responsible for following up on the proposed decisions and recommendations; establishing a timetable for implementing the results of the process and addressing the costs of implementation and monitoring; dealing with a process for review and revision that outlines who will be responsible for monitoring, review, and if necessary, renegotiating parts of the agreement (Canadian Round Tables, *Building Consensus for a Sustainable Future: Guiding Principles*, 1993).

The application of consensus processes may often take considerable amounts of time and resources on the part of the participants, yet opportunities for establishing consensus process exist at all stages of the decision-making process. Consensus processes, while not suitable for all situations, have the following advantages:

- Improve the working relationship between all interests participating in the process.
- Help to build respect for and a better understanding of different viewpoints among participants.
- Lead to better informed, more creative, balanced and enduring decisions because of the shared commitment to and responsibility for the process, results and implementation.
- Can often be used to complement other decision-making processes.

5.7 Municipal Environmental Assessment

The use of environmental assessments by the federal and provincial governments is discussed in Sections 6.1.4 and 6.2.4 respectively. For the most part, municipal governments have not established environmental assessments for new development or redevelopment projects, even though many of these have important individual and cumulative impacts that are not covered under the provincial or federal environmental assessment legislation. One exception to this is the City of Ottawa, Ontario. In 1991, Ottawa City Council approved the Municipal Environmental Evaluation Process (MEEP). MEEP provides a mechanism to ensure that potentially adverse impacts on the environment are considered in a consistent manner in the planning and implementation of public and private sector undertakings. MEEP is designed to be efficiently accommodated within the already existing development approvals procedure so as not to create delays in the municipal development control process. Major components of MEEP include the following:

- Activities which require City Council approval or Planning and Development approval are subject to the application of MEEP. These include construction or renovation on municipally owned land, municipal non-development activities which impact upon the environment, private sector development proposals which require municipal approvals (Site Plan Control Amendments and Zoning By-law Amendments etc.) and development proposals from other agencies or governments. Lists have been developed which may automatically exclude or include a project in the process.

- MEEP is applied early on in the development process, after the project is sufficiently conceptualized to allow the evaluator to be aware of all the possible impacts, and before the planning application is made or before a submission to City Council is presented.
- Public participation in MEEP is integrated into existing public participation opportunities in the development process and through City Council.
- The Process is based on self-assessment. Each applicant is responsible for making the environmental recommendations on proposals over which it has decision-making authority. Initial evaluation (Phase I) is completed based on available knowledge and expertise. This involves a screening of the proposal to determine if a detailed study of potential impacts and mitigation methods is necessary. The Environmental Screening Checklist is used to assess potential impacts on land, air, water and socio-economic concerns. Included are items such as the impact on wildlife, noise pollution, industrial emissions, stormwater, groundwater and human health.
- Phase 2 of the process involves a Municipal Environmental Evaluation Report (MEER) which applies to developments on the Automatic Inclusion List. These include proposed developments within the City's Greenway System, on contaminated sites, unstable slopes or within a provincially designated Area of Natural or Scientific Interest and snow disposal sites. A MEER involves a detailed assessment of the environmental impact and a description of proposed measures for mitigation. Given its technical nature, a MEER may require additional expertise when in-house knowledge is not available.
- All MEEP documentation is directed to the Environmental Management Branch and the Environmental Advisory Committee as part of the development approval application process. The Environmental Management Branch will review MEEP documentation and provide comments on the environmental impacts and proposed mitigation. The findings of MEEP are summarized under the Environmental Impact Section of City Council Submissions. The provincial Planning Act provides a process for conflict resolution over proposed development through the Ontario Municipal Board.

MEEP has a number of advantages. It provides for consideration of the environment in local decision-making and development when federal and provincial environmental assessments do not apply. MEEP promotes education and awareness among developers, engineers and municipal staff and officials on the importance of integrating environmental and social considerations into developments and environmentally significant non-development related activities. For more information on MEEP, contact the Environmental Management Branch of the City of Ottawa and ask for a copy of *The City of Ottawa's Municipal Environmental Evaluation Process (MEEP): Guidelines For Application*.

"The integrated and interdependent nature of the new challenges and issues contrasts sharply with the nature of institutions that exist today. These institutions tend to be independent, fragmented, and working to relatively narrow mandates with closed decision processes. Those responsible for managing natural resources and protection the environment are institutionally separated from those responsible for managing the economy. The real world of interlocked economic and ecological systems will not change; the policies and institutions concerned must."

The World Commission on Environment and Development, *Our Common Future*, 1987.

6 INSTITUTIONAL CONTEXT: PRINCIPAL ACTORS IN CANADIAN URBAN POLICY

There are a multitude of organizations directly or indirectly involved in urban policy development and implementation in Canada. In addition to three orders of government, many non-governmental organizations spend considerable time and resources to promote urban sustainability. The following is an overview of the principal governmental and non-governmental institutions in Canada which directly and/or indirectly impact on efforts to develop urban sustainability, with emphasis given to the role of the federal government, a focus of the Project Group on the Ecological Cities. A broader range of institutions are included than might at first be expected in order to better reflect the social, economic and environmental dimensions of sustainability. The influence of these organizations range from activities such as the provision of social services like health care and affordable housing and the manipulation of the market through taxes and subsidies, to the provision of public policy research and the public educational services. An analysis of how these institutions interact, related issues, and a detailed description of several key integrative institutions are contained in Section 7. Making progress toward urban sustainability requires an unprecedented level of co-operation between all three orders of government in Canada since each has sole or shared jurisdiction over the different components required for success.

6.1 The Federal Government

The Canadian federation consists of the federal government, 10 provinces, three territories and over four thousand municipal governments. Canada's Constitution and political system results in all three orders of government having some degree of authority for environmental, social and economic issues relating directly to the development of urban sustainability. The *Constitution Act of 1867* brought together the provinces of Nova Scotia, Quebec, Ontario and New Brunswick to form the federal government and while each province maintained its courts and local system of laws, the federal government was granted powers over matters that were of national scope and importance at that time.

In the Canadian Constitution there is no strict provision that relates directly to environmental matters. Federal and provincial governments derive their powers from different provisions, each exercising supremacy in some areas and sharing jurisdiction in others. Historically, the federal government's environmental responsibilities have been derived from several of its exclusive powers. These include the power to: regulate international and inter-provincial trade and commerce; regulate navigation and shipping; regulate seacoast and inland fisheries; impose taxes and spend money raised by taxation in any way the government chooses, except if spending interferes with provincial jurisdiction; make criminal laws (interpreted as the power to protect public health); and regulate works or undertakings that are provincial or international in nature such as shipping, telegraphs, inter-provincial pipelines, and works that, although they may be wholly situated in one province, are declared by Parliament to be to the general advantage of Canada (Swaigen, *Environmental on Trial: A Guide to Ontario Environmental Law and Policy*, 1993). In addition, the federal government has the sweeping power to make laws for the "peace, order and good government of Canada".

Provincial governments have complete jurisdiction over municipal governments in Canada. Yet while it is not always recognized within the federal bureaucracy, the federal government continues to exercise tremendous influence in a number of important areas relating to urban sustainability. The federal public service is comprised of 21 departments, and numerous agencies, boards, commissions and crown corporations. Following is a brief summary of the principal federal departments and agencies which exert a direct and/or indirect influence upon the social, economic and environmental sustainability of urban regions. For each department or agency listed, a brief description of its mandate is provided, followed by selected examples of how its activities impact upon municipal and provincial governments, and their ability to develop and implement policies in support of urban sustainability.

6.1.1 Canada Mortgage and Housing Corporation

The federal government's role in housing stretches back to the 1935 *Dominion Housing Act*. CMHC was established by the federal government in 1946 to ensure that all Canadians have access to affordable housing. Under the *National Housing Act*, CMHC helps to promote the construction of new houses; the repair and modernization of existing housing stock; and the improvement of housing and living conditions, through a wide range of activities in three main areas: market housing, social housing and housing support. Market housing initiatives use financial instruments such as mortgage insurance and mortgage backed securities to help Canadians obtain financing for home ownership and rental. Social housing programs involve the provision of housing for those who cannot afford adequate market housing such as the elderly, the disabled, aboriginal people, single parents and the working poor. Housing support includes activities ranging from research and development into sustainable housing technologies and policy development, to market analysis, land development and international activities. Many of the activities undertaken by CMHC are delivered through a range of federal-provincial agreements.

As the federal housing agency, CMHC has more direct involvement in Canada's urban regions than most federal crown corporations and departments. CMHC exerts a direct and/or indirect impact upon the development of urban sustainability by:

- Providing direct financial and other support for provincial and municipal social housing.
- Conducting internal research on the social, economic, technical and environmental aspects of housing, infrastructure, and community design and planning.
- Providing external support for research into urban sustainability through, for example, the National Housing Research Committee, the Centre for Future Studies in Housing and Living Environments, the recently established Canadian Centre for Public/Private Partnerships in Housing and the CMHC Scholarships program.
- Influencing market demand over the type and location of future housing development, through, for example, eligibility requirements for mortgage insurance and security programs.

- Providing support for the upkeep of Canada's housing stock through programs such as the Residential Rehabilitation Assistance Program, which affects levels of energy and water consumption, as well as ensuring community stability by providing adequate housing for disadvantaged groups.
- Exercising direct responsibility for lands owned by the federal government and co-owned with provincial and/or municipal governments.
- Supporting programs such as Affordability and Choice Today (ACT) which provides financial assistance to encourage partnerships to improve housing through regulatory reform, demonstration projects, and other innovations.
- Producing and disseminating data and statistics on housing and building activity in Canada.
- Facilitating the participation of other federal government departments and agencies in urban policy research, such as the National Research Council, Health Canada, and Natural Resources Canada, through joint research projects and programming and by advising them on a broad range of matters relating to housing policy.

6.1.2 The Department of Finance

The Department of Finance is the primary federal department for economic and financial policy, both domestic and international in scope. The Department of Finance assists the government in deciding upon and implementing financial and economic objectives through a range of activities such as: providing guidance on fiscal and economic policies, and the proposed policy measures of other departments; recommending measures to meet government requirements within appropriate fiscal policies by action through expenditure, lending, taxation, borrowing and cash management; advising on policies relating to federal-provincial fiscal and economic relations and grants to provincial governments; and administering statutes relating to the capital budgets and the financing of Crown corporations and agencies.

The federal government's financial impact upon sustainability is broad, including tax measures and spending in the form of transfers, subsidies, grants, loans and loan guarantees. Selected examples of federal financial influence include:

- Tax measures directly affect the level of municipal government finance, in so far as they apply to municipal expenditures of roughly \$10 billion annually.

- Taxes and subsidies on general goods and services influence consumption patterns, thereby affecting the demand for various municipal services. The fact that Canada has the second lowest energy taxes in the world is cited as a disincentive against effective energy efficiency programming (MacNeil in, Gillies, *The Greening of Government Taxes and Subsidies*, IISD, 1994).
- Federal direct transfer payments to municipal governments in lieu of property taxes on facilities for federal departments and agencies.
- Indirectly, transfer payments to the provinces impact upon the provinces' ability to provide financial resources to local municipal governments who are largely dependent upon such support.
- The federal government's corporate tax structure directly influences the behaviour of firms in many ways which impact upon municipalities. Examples include matters such as: the ability of corporations to deduct parking fees, but not transit passes for their employees, thereby providing a disincentive to private sector public transit programs; the tax treatment of older buildings which provides owners with incentives to demolish rather than renovate, thereby increasing the quantity of demolition waste in municipal landfill sites - the national rate of which has been estimated at 31 per cent of total solid waste; and the non-preferential tax treatment of donations of land to municipalities to be preserved as urban green space.

A comprehensive analysis of the relative impact of tax and subsidy measures on urban sustainability would take into account the many tax and subsidy policies of the provincial and municipal governments. Total subsidies from government to industry are estimated to amount to \$11 billion annually - non-capital subsidies to the four largest industries in 1989 dollars totaled \$3.629 billion to agriculture and food; \$2.314 billion to transportation; \$1.973 billion to finance and real estate; and \$1.152 billion to communications (Statistics Canada, in Clément, *Environmentally Perverse Government Incentives*, NRTEE, 1992).

The federal government transfers funds to the provinces under three main programs: Established Program Financing, which supports provincial education and health care; Equalization Payments, which ensure the equitable provision of services across Canada by providing additional support to less wealthy provinces; and the Canada Assistance Plan, which provides unemployment insurance and basic welfare support. Together, these programs will cost an expected \$37.1 billion in fiscal 1994-95, an overall increase of 3.3 per cent from 1993-1994. Since 1990-91, the federal government has frozen *per capita* Established Program Financing for all 10 provinces

and has capped growth on total Canada Assistance Plan payments to the three wealthiest provinces, British Columbia, Alberta, and Ontario to five per cent.

6.1.3 Environment Canada

Environment Canada is the federal department primarily responsible for environmental matters. It has power and responsibility pertaining to the preservation and enhancement of the natural environment, renewable resources, water, and meteorology. Environment Canada regulates pollution from some private business activities and also undertakes a 'watchdog' function over the activities of other federal departments which impact upon the environment, most notably, the Department of National Defence and the Department of Public Works. With the consent of the federal Cabinet, Environment Canada may make binding regulations on other federal departments with respect to the release of air and water pollutants and waste disposal practices. This responsibility is important since federal departments are beyond the reach of provincial environmental legislation (Swaigen, 1993).

The range of influence Environment Canada exerts on local municipalities is broad and includes:

- Pollution control and clean-up of federally regulated businesses as well as control over the import and export of toxic substances, primarily through the administration of the *Canadian Environmental Protection Act*.
- Establishing national water quality standards, water quality monitoring, reducing flood damage and river-basin planning, land resources development, and the protection of endangered or threatened species.
- Responsibility for the protection of international boundary waters such as the St. Lawrence Seaway, and the Great Lakes and the Pacific Shelf ecozone, which may involve pollution sources originating from municipal water and waste water treatment or firms located in urban regions.
- Establishment and administration of a number of programs and initiatives that directly involve municipal governments such as, Canadian Environment Week, and support for broadly targeted public education and voluntary action through, for example, the Environmental Citizenship Initiative, which promotes individual and collective educational initiatives in support of environmental literacy, and volunteer environmental activities.

- Conducting studies, collecting and disseminating information on numerous subjects of urban interest which include municipal water use and treatment; waste management, and air quality as well as a range of sustainability indicators through national State-of-Environment Reports and regular State-of-Environment Bulletins.
- Responsibility for establishing a variety of joint federal-provincial environmental agreements, programs and activities ranging from the harmonization of environmental legislation, to the Great Lakes Clean-up Fund, the latter involving activities such as the development and demonstration of storm water treatment technology and the establishment of municipal government storm water management plans.
- Maintaining a network of relations between federal government departments, industrial organizations, international organizations and other stakeholders to improve the degree to which environmental considerations are integrated into decision-making.

6.1.4 Federal Environmental Assessment and Review Office

The Federal Environmental Assessment and Review Office (FEARO) administers the federal Environmental Assessment Review Process (EARP) and reports to Environment Canada. The new *Canadian Environmental Assessment Act* (CEAA) which received Royal Assent in June 1993 established a new framework for environmental assessments and a new agency, the Canadian Environmental Assessment Agency, to replace FEARO. The CEAA generally applies to selected projects involving federal authorities as proponents, as vendors of land or landlords, as donors of financial aid to the project (including private sector projects and municipal infrastructure projects), and in designated cases, as a licensing or regulatory authority. In addition to infrastructure and other developments which involve federal funding, proposed developments to harbours, airports, and other significant federal facilities located in urban regions may also be subject to the federal environmental assessment process.

Given the relative importance of federal government's environmental assessment legislation the following brief outline of its applicability to municipal and provincial government developments has been provided. CEAA establishes four types of environmental assessments:

- A Screening involves 95 per cent of all assessments and is undertaken by the responsible federal authority for the project. The federal authority retains the greatest degree of management and flexibility over the scope and pace of the environmental assessment process and screenings will vary in time, length and depth of analysis, depending on the exact circumstances of the project. Most screenings typically include matters such as culvert installations, dredging, highway maintenance, shoreline stabilization and building construction.
- A Comprehensive Study involves projects that are larger but of a certain size (determined by the CEAA regulations), and require a more intensive and vigorous assessment than a Screening. Examples of these types of projects include large industrial plants, nuclear power facilities, major pipelines and electrical generation projects. A comprehensive study is managed by the responsible federal authority and must consider a wider range of factors than a Screening. A comprehensive study is subject to review by the Canadian Environmental Assessment Agency and the public.
- Mediation and Public Review Panels are advisory in nature and provide the public with the opportunity for direct participation. These types of assessments are undertaken for a number of reasons, including to determine if a project is likely to cause significant, adverse environmental affects and if it is uncertain whether the affects can be justified. Mediation reviews involve a voluntary process of negotiation in which an independent mediator helps the interested parties resolve their issues through consensus. Meetings or hearings open to the general public are held in a Panel Review and are usually not part of a mediation, where members of the public participate as representatives of the interested parties. The use of open public review panels are determined by stakeholders.
- Under independent Public Review Panels, the Minister appoints members of the panel which conducts public hearings on a proposed project and makes publicly available the information required to conduct the environmental assessment. Public reviews may be conducted jointly with other jurisdictions. Public reviews and mediations result in reports containing recommendations to the Minister of the federal authority concerned (CEAA, *A Guide to the Canadian Environmental Assessment Act* , 1993).

Every federal department, including Environment Canada, has the responsibility for conducting the first two types of assessments on projects which impact on areas of federal jurisdiction. For example, if a municipal government wished to build a new bridge which would affect fish migration, the federal government would likely have the authority, under *The Fisheries Act*, to subject the proposal to some form of assessment, the scope of which would cover only areas of federal jurisdiction. For major projects which have a high level of public interest, the Canadian Environmental Assessment Agency would be responsible for administering the process on behalf of the federal department(s) concerned. Environmental assessments can lead to significant changes to the size, structure, or location of the proposal and may even prevent it from proceeding. Provincial governments also have various types of environmental assessment legislation. Efforts are underway to harmonize federal and provincial environmental assessment statutes. Those interested in more detailed information on federal environmental assessments should obtain a copy of *A Guide to the Canadian Environmental Assessment Act* from the Canadian Environmental Assessment Agency.

6.1.5 Transport Canada

While the federal government has no direct responsibility in urban transportation matters, it administers many programs, policies and research activities which directly affect the sustainability of urban transportation. Transport Canada is responsible for transportation safety and security regulations and the administration of national and international transportation policies and programs. Transport Canada has four groups within the department responsible for administering airports, aviation, marine and surface transportation operations. These have a number of responsibilities which directly impact upon municipal government:

- The administration of a number of statutes containing environmental protection provisions relating to modes of transport such as the *Transportation of Dangerous Goods Act*, the *Motor Vehicle Safety Act*, the *Canada Shipping Act*, the *Navigable Waters Protection Act*, the *National Transportation Act* and the *Railway Act*. Regulatory responsibilities resulting from these Acts include the establishment of emission and fuel efficiency standards for new automobiles and regulating the international and inter-provincial flow of hazardous materials.
- Developing marine regulations that contribute to marine safety and environmental protection, responding to clean-up requirements for ship-source pollution and providing a system of ports and public harbours through the Canadian Coast Guard.

- Responsibility for a number of Crown Corporations having varying degrees of autonomy but whose operations are of importance to urban regions and in some cases, critically important to smaller urban centres in Canada. These include Via Rail Canada which provides subsidized rail passenger services across the country, ranging from transcontinental trains to fast intercity trains serving parts of eastern Canada; the Canada Ports Corporation which administers Canada's ports partly through a system of highly autonomous local port corporations; the St. Lawrence Seaway Authority which is responsible for the operation, and maintenance of the Canadian part of the Seaway; and the Canadian National Railway, which has a high degree of autonomy and major interests in rail-based transport and distribution in Canada and the U.S., as well as real estate development and telecommunications technology transfer. Funding cuts to passenger rail services and other forms of transportation increase the burden on existing road systems, a large portion of which are developed and maintained by provincial and municipal governments.
- the ownership and operation of 72 airports, many of which are located in urban regions and smaller urban centres.

Transport Canada and the crown corporations who report to it are also significant owners and administrators of land in major urban regions across Canada and therefore have a direct stake in urban land-use and transportation planning. Air and sea ports are also extremely important to the host urban regions due to their significant economic contributions to the regional economy. The existence of a federal airport also provides urban regions and smaller centres with significant levels of tax revenue; may act as an important economic stimulus; and in the case of smaller urban centres, provides vital transportation linkages. Recent measures to commercialize as many as 26 federal airports and to withdraw federal financial support are of concern to many communities for these and other reasons. The movement of people and goods across Canada has historically been influenced by many transportation subsidies from the federal government, in large measure, to help overcome the substantial economic barriers to transport, resulting from the enormous size of the country. In part, the trend toward the rising utilization of truck transport, largely at the expense of rail transport, may be attributed to differences in the level of subsidies provided by government.

6.1.6 Natural Resources Canada

Natural Resources Canada (NRCan) is concerned primarily with Canada's land mass, promoting the sustainable use of mineral, energy and forestry resources. The energy

sector of NRCan has a broad range of responsibilities concerned with developing energy policy of a cross-sectoral nature, including conservation, renewable energy, and transportation fuels. NRCan funds the development of, and research on, energy conservation and alternative energy technologies. In addition, NRCan funds programs which include subsidies for fossil fuel exploration and development such as the Hibernia offshore oil project on the Atlantic coast, as well as providing support to the nuclear industry through Atomic Energy of Canada Ltd. The subsidization of traditional sources of energy is commonplace among developed nations. The federal government budgeted \$5.1 billion over four years in 1993 for loans and grants to extract fossil fuel resources and \$160 million for alternative energy sources over the same period (*FCM, Policy Development Book, 1993*). It is argued that such subsidies make it more difficult to promote alternative forms of energy, reduce the effectiveness of urban energy conservation programs, and help to promote the continuing growth of private automobile use.

Since 1990, NRCan has been implementing an Energy Efficiency and Alternative Energy Program, which includes several initiatives and a variety of instruments to help the demand side of the energy market become more energy-efficient. A recently published document entitled, *Report to Parliament on the Administration and Enforcement of the Energy Efficiency Act, 1992-1993*, by NRCan, contains more detailed information on federal and joint federal-provincial energy efficiency and alternative energy initiatives.

6.1.7 Human Resources Development Canada

Human Resources Development Canada (HRDC) develops, co-ordinates and administers federal labour market policies designed to help achieve Canada's economic and social goals. HRDC assists Canadians as they move in and out of the workforce by administering the Employment and Insurance program, which provides temporary assistance and job training to the unemployed. It also provides care and support for those unable to enter the workforce through cost sharing programs such as the Canada Assistance Plan which is jointly financed and administered with provinces and territories. In addition to providing a number of income security programs, HRDC administers the Community Development Program to assist communities in moving towards self-sufficiency and to increase employment activities. Social support provided by the federal government through this department has an important role in ensuring a basic level of equity within Canada. Changes to these programs often have direct and indirect impacts on the level of municipal finances. This may occur directly by requiring added municipal resources through, for example, increases in employee premiums for employment insurance, or indirectly, by increasing the demand on existing social services funded and administered municipally and provincially as a result of changes to federal social services.

6.1.8 National Research Council

The National Research Council (NRC) is the federal government's premier science and engineering organization, accounting for approximately 10 per cent of federal expenditures on science and technology. Its employees work in a wide range of fields ranging from biotechnology to microelectronics. The NRC supports the Institute for Environmental Research and Technology which has a number of technical programs involving industry partners, the components of which often pertain to matters concerning urban sustainability. Activities range from investigating the effects of alternative fuels on urban air quality and solid waste reduction, to combustion process controls for incineration and water treatment through membrane technology. The NRC also runs the Institute for Research in Construction, with a focus on issues such as organic and inorganic construction materials, structural safety, building envelope, indoor air quality and energy conservation, urban infrastructure and the development of national model building codes. The NRC's Institute for Surface Transportation Technology focuses on road vehicle performance, rail vehicle and pavement performance. The NRC is also responsible for producing the *National Building Code*; the *Canadian Plumbing Code*; *Measures for Energy Conservation in New Buildings*; and other code-related regulatory documents. Provincial governments have principal jurisdiction over building codes and prior to the 1970's generally delegated this responsibility to local municipalities. The National Building Code is adopted by some provinces with few changes. In 1991 CMHC published a study entitled, *Innovation and Building Codes* for those seeking further information on the role of building codes in Canada.

6.1.9 Public Works and Government Services Canada

Public Works and Government Services Canada is mandated to foster the cost-effective and efficient delivery of common services to government. The department is the government's chief purchasing agent, landlord, publisher, accountant, paymaster, banker and provides services in real estate, design and construction and telecommunications. The Supply Operations Services and Regional Directorates procure some 17,000 categories of goods and services, ranging from war ships to janitorial supplies, under contracts totaling approximately \$16 billion annually (CCH Canadian Ltd., *Canadian Government Programs and Services*, 1994). Government procurement has long been utilized as a method of achieving social and economic objectives such as national and regional economic development. Over 3,200 federal government-owned buildings and approximately 3,500 leases are administered by the Realty Services of this department. Realty Services is also responsible for municipal grants in lieu of property taxes, which totaled \$426 million in 1992-93.

Real Property Services manages approximately 22.5 million hectares of federally-owned property which ranges from large tracts of undeveloped land in the Northwest Territories to ferry terminals and museums. The federal ownership and management of significant property in Canada's urban regions, without having legal responsibilities to provincial or municipal governments has important ramifications. For example, federal facilities are not subject to provincial or municipal environmental legislation or regulations and cannot be directly taxed. The significant holdings of the federal government also afford it considerable opportunities to promote urban sustainability in a wide variety of areas from energy and water conservation, to the promotion of public transit. Recently, Public Works and Government Services Canada has been improving environmental procurement through its Going Green program which promotes the use of environmental products and services among federal departments and agencies.

Architectural and Engineering Design Services (AES) are provided to federal departments and agencies on a cost recovery basis for the construction, maintenance, and renovation of property as well as professional advice, and environmental services. AES services include environmental audits, environmental protection, planning and related studies, risk analysis, hazardous materials and the management and rehabilitation of contaminated sites. AES also provides services related to airport planning, design and operations; highway and bridge planning, design, and project management; and the design, planning and management of marine structures.

6.1.10 Citizenship and Immigration Canada

Citizenship and Immigration Canada's responsibilities include the development of immigration policy, management of immigration levels and participation with other federal departments in developing related policies. In co-operation with other orders of government, and with non-governmental and intergovernmental organizations, it assists newly arrived immigrants to adapt and settle in Canada. The department is also responsible for promoting the concept and values of Canadian citizenship among newly arrived immigrants. Immigration agreements are negotiated with some provinces and immigration policy is developed on major issues, domestic and international legal and institutional frameworks. The impact of immigration to Canada is felt most keenly by Canada's largest urban regions which receive the majority of new Canadians (see Section 2.2).

6.1.11 Treasury Board Secretariat

The Treasury Board is perhaps the most powerful internal organization within the federal government structure. It is responsible for reviewing the personnel, administrative and financial management policy considerations of the government of Canada. While macro spending is determined by the Department of Finance through the budgetary process, the Treasury Board makes recommendations concerning the allocation of resources to individual government departments and agencies. It has responsibility for assessing the financial and management implications of new programs and policies being considered by Cabinet and has authority over expenditure management and control. The Treasury Board is also responsible for the National Infrastructure Program which impacts municipalities directly.

6.1.12 Regional Economic Development Agencies

The federal government has three regional development agencies, Western Economic Diversification, the Federal Office of Regional Development - Quebec and the Atlantic Canada Opportunities Agency, offering a range of business support services through grants and loan guarantees. Funding for regional economic development programs exceeded \$600 million in 1992-93, spread across a number of programs. Some of these programs encourage the private sector to improve its environmental performance and support the development of new environmental technologies and services.

6.1.13 Canadian International Development Agency

The Canadian International Development Agency (CIDA) supports the efforts of developing countries to achieve sustainable economic, environmental and social development. Through the support of CIDA's Canadian Partnership Branch, the FCM's International Office offered a number of international programs to Canada's municipal governments. At the core of these is the International Partnerships Program, which supports a variety of activities to assist Canadian municipalities to establish municipal government partnerships in Africa, South-East Asia, China, and the Americas. These activities facilitate information exchange, training and economic development. CIDA's support for efforts to increase awareness among municipal governments of the challenges facing local governments in the developing world, provides excellent opportunities for skills and expertise exchange as well as providing opportunities for local businesses to improve imports and exports. In addition, FCM International has played an important role in helping municipal governments organize on the international stage more effectively through its support for the

founding of Commonwealth Local Government and the world congresses of the International Union of Local Authorities.

6.1.14 Industry Canada

Industry Canada is the federal government's primary economic development department. Its mandate is to promote the competitiveness and growth of Canadian business, create jobs in cities and support the development of technologies and services. Many of these promote urban sustainability. Industry Canada's tasks include: to formulate, integrate and co-ordinate policies and regulations regarding industry science, telecommunications, broadcasting, investment and competition in the marketplace; reduce internal trade barriers; provide strategic intelligence, analysis and other business services; to promote regional economic development in northern Ontario; to promote early stage research and development within the private sector; and to set and enforce regulations to protect consumer interests. Industry Canada spent just over \$700 million in 1992-93 in the form of grants, loans and other transfers to Canadian businesses through a variety of programs, which include support for the environmental goods and services sector. Industry Canada has an Environmental Affairs Branch with a number of programs and activities supporting the environmental industry, which has an important role to play in developing urban sustainability and exporting Canada's expertise. In co-operation with Environment Canada, Industry Canada recently released *A Strategy for the Canadian Environmental Industry*, which established new federal government support initiatives for small and medium-sized firms working to develop and commercialize environmental products and services in support of developing sustainability.

6.1.15 Health Canada

While primary responsibility for health care matters rests with provincial and territorial governments under the Canadian Constitution, the federal government exercises authority in a number of important areas through Health Canada. It is responsible for: the investigation and research into public health and welfare; the inspection and medical care of immigrants; the supervision of health facilities on railway, water, and all other forms of transportation; the collection, publication and distribution of information relating to public health, improved sanitation, and social and industrial conditions affecting human health; and co-operation with provincial authorities with a view to coordinating efforts made to preserve and improve the public health and social security of Canadians. The Environmental Health Directorate of Health Canada assesses and investigates the health hazards associated with environmental pollutants, pesticides, radiation sources and hazardous products.

The federal government contributes financial resources to provincial and territorial health care systems through a system of twelve interlocking health insurance plans which constitute a national health care program. Federal government financial assistance is provided through the *Canada Health Act, 1984*. This Act insures that health care insurance systems in Canada: cover all medically necessary hospital and physician services and surgical-dental services rendered in hospitals; are universally available to everyone within a province or territory on uniform terms and conditions; are portable between provinces and territories; and are easily accessible. The *Canada Health Act* is administered by the Health Insurance Directorate and is the responsibility of the Minister of Health. Canada's health care system is an important social service which provides an essential level of social equity among Canadians, thereby forming a cornerstone of Canada's social sustainability as described in Section 1. The federal government's role in successfully ensuring that provinces, most of whom are operating through deficit financing, continue to comply with the *Canada Health Act*, has important social implications in areas such as labour mobility, economic productivity, health care standards, and general social welfare.

Health Canada undertakes research and programming in a number of other areas of importance to urban social sustainability through programs to promote independence for seniors citizens, and research on family violence. Health Canada also plays an important role in representing the interests of Canada's children within the federal government, in part through by providing advice on policies and programs in response to children's needs.

6.1.16 Foreign Affairs and International Trade

Foreign Affairs and International Trade has a variety of responsibilities which include the development of international trade and immigration policy. Trade agreements such as the *Canada-U.S. Free Trade Agreement* and the *North American Free Trade Agreement* promote economic restructuring which impacts upon the economies of urban regions in Canada, particularly those more dependent upon the manufacturing sector. Agreements such as these also help to support the world-wide trend toward the increasing globalization of business. Domestic economic restructuring has meant a decrease in business activities in certain sectors, such as manufacturing, and this has had an impact directly upon municipal tax revenues due to the loss of commercial property taxes. In some provinces, the tougher business climate has also helped to push businesses from core to less heavily taxed suburban regions in an effort to reduce cost and compete more effectively internationally. The globalization of business has prompted many municipal government economic development offices to initiate activities in support of firms wishing to locate production in their jurisdiction or to assist existing firms to intensify or enter into new export markets.

"Often the jurisdiction or authority necessary to fully address an environmental issue is highly fragmented. Provinces must re-examine their urban regions with sustainability in mind."

Phil Ferguson, Executive Director, Canadian Urban Institute, 1994.

6.2 Provincial and Territorial Governments

Historically, the federal government had a larger role in municipal governance through direct grants, but financial and other direct linkages have been broken by provincial governments in recent years. While the activities of the various federal agencies and departments still have considerable influence on municipal governance in Canada, the 10 provincial governments exercise complete jurisdiction over municipal government responsibilities, financing and structure. The three territorial governments in Canada, the Northwest Territories, Nunavut (as of 1999), and the Yukon Territory, do not enjoy the same constitutional status as provinces and are subject to the exclusive jurisdiction of the federal government in some areas. Provinces have considerable authority, exercising dominance over the federal government in a number of important social, environmental and economic areas of public policy which directly influence progress toward urban sustainability.

Canadian provinces vary considerably, not only in terms of their population and size, but also in terms of their wealth and economic composition and strength. Provincial governments typically consist of between 15 to 20 core departments as well as a number of commissions, crown corporations and special boards. Departments are vertically structured according to various sectors - forestry, government finance, health, agriculture, energy and environment - with provincial environmental departments operating in a separate and distinct manner from other departments. Recently, in the Province of Ontario, the ministries of Energy and Environment were merged in order to deliver services more effectively. Each province has a department dedicated to municipal affairs and a number have housing and public utility corporations. Several interview participants felt that the institutional structure of most provinces has not kept pace with increasing levels of urbanization and the changing nature of the economy, since they still largely reflect natural resources exploitation-centred economic activities. While it is difficult to generalize among provincial governments given their considerable differences, the following is a brief outline of their relative powers and responsibilities as they relate sustainable urban development in the three broad areas of environment, economy and society.

6.2.1 Environmental Jurisdiction

Provincial governments have a dominant role over the federal government with regard to jurisdiction over environmental matters. The exclusive Constitutional powers used to support provincial jurisdiction dealing with environmental matters include: the control of natural resources (except uranium which is federally controlled); the management and sale of public lands belonging to the province and the resources on these lands; power over property and civil law within the province (which includes the right to enter into contracts and make business); and generally, power over all matters of a merely local or private nature. The power to establish and control municipal governments provides provincial governments with considerable environmental authority.

Provincial governments wield important regulatory power in areas such as land-use planning; solid and hazardous waste; pollution control; energy production and conservation; a broad range of water resources management including water treatment and supply; environmental protection and assessment; and natural resources exploitation and conservation. Environmental assessment legislation varies among the provinces, both in terms of the procedures established, scope and applicability. In some provinces, such as British Columbia, environmental assessments apply to designated private sector developments. In others, such as Ontario, they are restricted to government developments, including those undertaken by municipalities.

Provincial governments have a variety of forms of environmental protection legislation, some more comprehensive than others. This type of legislation pertains to the activities of the private sector and usually includes measures to control the discharge of various emissions from industrial practices. Environmental protection policies are spread among a number of different statutes - over 40 in the case of both Ontario and British Columbia (Statistics Canada, 11-509E, 1994).

Land-use and planning legislation are important tools used by most provincial governments to exert some level of control over the development process undertaken by municipal governments. Some municipal governments, such as those located in Quebec, are given broad powers over development, while others must seek provincial approval of their municipal Official Plans and specific development applications. Land-use planning legislation is also being used to protect certain types of landscapes, such as wetlands or specific areas from development pressures. Environmental protection, environmental assessment, and land-use and planning legislation are key legislative tools which allow provincial governments to control and regulate, to varying degrees, urban development.

Most provincial governments also control provincially-owned electrical utility monopolies, the three largest being Ontario Hydro, Hydro Quebec and B.C. Hydro. The development of generating facilities, electrical rates and regulations, conservation and educational programs, energy pricing, land ownership of contaminated and non-contaminated sites, hydro-corridors, and district heating are examples of the important influence provincially-owned utilities exert on the development of urban sustainability.

6.2.2 Economic Jurisdiction

Provincial governments exercise broad powers with respect to borrowing and expenditure. These powers enable them to play a significant role in promoting economic development within their borders. Provincial governments also have considerable powers with respect to inter-provincial trade and several have traditionally utilized these powers to promote local economic development, often at the expense of Canada's common market. Each province has a Department of Industry and Trade, Tourism Development, and various departments of Natural Resource Management and Exploitation. Provincial governments have gained considerable powers from having Constitutional responsibility for the management of their natural resources. They share responsibility with the federal government over firms in resource-based industries such as forestry, fisheries, energy, mining and mineral development. Responsibility for building codes and regulations are primarily provincial jurisdiction and have, to varying degrees, been delegated to municipal governments. Provincial governments exercise power over transportation planning, provincial highway construction and maintenance, labour relations, and corporate and consumer affairs - particularly the authority to regulate the activities of provincially incorporated private sector firms; and the regulation of financial institutions.

6.2.3 Social

The maintenance of social sustainability is shared between the three orders of government across different areas and jurisdictions. Through a number of cost sharing programs with the federal government, provincial governments fund numerous social services. These generally include the following:

- Education - including the creation of local and regional school boards, the funding of primary and secondary schools, and university and college standards and financing.

- Health services such as community health facilities, hospital administration and funding, health education, health care insurance, emergency services, mental health, public and family health services.
- Social activities which include affordable housing programs, seniors' programs and services, drug plans, alcohol and drug rehabilitation programs.

The federal and provincial governments also share a role in the provision of social services which include support for the arts, theater, museums, art galleries and other institutions which contribute directly to the quality of urban life in Canada. The federal government plays an important role in redistributing income across Canada to maintain a basic level of social service in each province. The level of social services, insofar as it differs, has an impact upon the migration of individuals within and between urban regions and provincial governments, and the overall quality of life in Canada's urban regions.

"Each order of government needs to take a higher level of responsibility for the environment. This means more than general guidelines. It means reinforcement, evaluation and monitoring, and provision of financial resources."

Anna Hercz, Senior Policy Analyst, City of Ottawa, 1994.

6.3 Municipal Government

Canadians have a complex system of local governance. There are over 4,000 incorporated municipal entities in Canada, ranging from massive metropolitan agglomerations that are larger than some nations, to communities of less than two thousand inhabitants. Canada's municipal government system is grounded almost entirely on law and practice. Historically, the establishment of municipal government was linked to property ownership. Urban property owners were granted the right to establish their own taxation system to build streets and public markets. Originally, the municipal franchise was generally restricted to male property-owners or lease owners. It was later democratized by developments coming from the United States (Sancton, 1991). The oldest incorporated municipal entity in Canada is St. John, New Brunswick, which received Royal Charter in 1785. Municipal governments are mentioned in the *British North America Act, 1867*, as one of the 'Classes of Subject', largely because they were already established in three British colonies. The municipal order of government is in a legally inferior position under the Constitution. In most jurisdictions, it can only perform functions specified by provincial governments. Provincial governments also have the power to establish various other special bodies to provide local services, such as school boards, hospitals, and police commissions.

All provincial governments have established various classes of municipal government and are able to delegate to them functions that are within provincial jurisdiction. The relative degree of municipal power and autonomy varies considerably within and among the provincial governments. The different categories of municipal governments, each exercising provincially legislated jurisdiction within its boundaries, have been established to reflect local circumstances such as geographic size, population, social and political factors. Regional governments were first established in the early 1950's and are generally comprised of representatives of local governments, providing selected services across large rural territories or urban regions. Table 10 illustrates the number and different types of municipal government in five provinces: Ontario, Quebec, Alberta, Prince Edward Island and British Columbia. In the following table, municipal governments have been divided according to whether they are regional (Tier 2), or local (Tier 1), in nature. The types of municipal governments listed in Table 10 each have differences in their structure, function and degree of authority. Most have different funding and jurisdictional relationships with provincial departments, agencies, and other local bodies such as school boards and police commissions.

Table 10: Selected Examples of Municipal Government Categories and Their Numbers

Province	Number and Type of Regional Municipal Government (Tier 2)	Number and Type of Local Municipal Government (Tier 1)
Ontario	39 - 26 Counties, 10 Regional municipalities, 1 Metropolitan municipality, 1 Restructured county and 1 District municipality	830 - 51 Cities, 144 Towns, 4 Separated towns, 472 Townships, and 116 Villages, 1 Borough, 3 Improvement Districts (One-half of the Villages population of less than 2000)
Quebec	99 - 96 municipalités régionales de comté, 3 communautés urbaines et l'Administration régionale Kativik	1469 - 2 Cités, Ville, Villages, Cantons, Canton-Unis, Paroisse, Village Nordique, Village cri, Village naskapi (Over three quarters of the local municipalities have a population of less than 2000)
Alberta	30 Counties (rural)	327 - 16 Cities, 110 Towns, 27 Municipal Districts, 120 Villages and 54 Summer Villages
Prince Edward Island	0	97 - 1 City, 7 Towns and 89 Communities
British Columbia	29 Regional Districts (all equivalent)	152 - 41 Cities, 52 Districts, 14 Towns, 44 Villages and 1 Islands Trust (Native self-governance arrangements under negotiation)

Source: *Provincial Ministries of Municipal Affairs, 1994*

Provinces delegate authority and establish municipal government structures and functions through legislation, primarily a Municipal Act and other statutes, up to twenty in some provinces. Provincial governments often change municipal boundaries and powers, sometimes against the wishes of municipal governments. In

many provinces, municipal governments can initiate boundary changes through annexations, amalgamations and new incorporation with the approval of their provincial governments.

In the provinces with regional municipal governments, and local municipal governments, the services listed in Table 11 are divided between these municipal governments. Tier 1 municipalities generally exercise authority over matters within their own areas, such as local roads, street lighting and zoning bylaws, while Tier 2 municipalities cover areas such as public transportation, social welfare, regional roadways, and land-use planning. Most two-tiered systems of municipal government have been structured so that representatives of bottom-tier councils make up the membership of the top-tier council in order to ensure the responsiveness of regional governments to local municipalities. In Manitoba and Alberta, the provincial governments have avoided the two-tier system, which often gives rise to conflict between municipal governments, particularly between those located on the periphery and those in the core. In the case of Manitoba, the province created the Winnipeg Unicity to cover its metropolitan area by amalgamating the surrounding municipal governments. Large core cities in metropolitan areas in Alberta have been granted considerable autonomy and regional planning is undertaken through special bodies, funded solely by municipal governments.

In Canada, municipal government structure, powers and responsibilities may include any combination of the regulatory and service functions listed below.

Table 11: The Range of Functions Among Canadian Municipal Governments

<ul style="list-style-type: none"> ● taxation powers, (property taxes and special fees) ● garbage and refuse collection and disposal ● land-use planning and regulation ● sewage collection and treatment ● water distribution and purification ● public transportation systems ● sidewalk construction and maintenance ● the establishment and maintenance of roads and streets ● social housing and community health services ● parking and the regulation of traffic services ● the licensing of selected businesses ● the provision of electrical and sometimes telephone utilities ● social welfare services 	<ul style="list-style-type: none"> ● parks management, including tree preservation and enhancement ● community or regional development ● industrial and commercial development and promotion ● local libraries and assistance to community organizations ● regulation of real property maintenance ● regulation of business practices ● commercial vehicle licensing ● building standards control through building permits ● drainage ● fire protection, street lighting ● recreational services
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Source: *Thompson Gow & Associates, 1994*

Municipalities are increasingly being called upon to provide various social services by the provinces. However, among the various functions listed in Table 11, land-use planning remains central to the Canadian municipal political process. Land-use planning procedures vary considerably among provinces with some, like Ontario, exercising explicit approval control, while others, such as Quebec, grant considerable authority for planning to regional and county municipal entities. Each province, however, has provisions for the development of an overarching plan by municipalities in urban regions that will provide a framework for future development and detailed land-use regulations. Land-use planning legislation provides municipalities with important responsibilities regarding matters like: the number, size and location of shopping malls; the preservation of heritage buildings and streetscapes, landscaping, the extent to which downtown and commercial functions may spread into adjoining residential neighborhoods; and the timing and density of new development. In the case of Ontario, the value of these plans to promote long range development objectives, such as the protection of green space, is seriously undermined by the large number of applications for Official Plan amendments to accommodate new development proposals (Royal Commission on the Future of the Toronto's Waterfront, *Planning For Sustainability: Towards Integrating Environmental Protection into Land-Use Planning*, 1991).

In addition to municipal authority over land-use planning, municipal governments often have important responsibilities over transportation planning, local economic development, zoning bylaws, road construction and maintenance, water treatment and supply, and solid waste management.

"If there is one paradigm shift the Round Table has been able to generate across British Columbia, it is that we are all stakeholders in sustainability."

Joy Leach, Chair, British Columbia Round Table on the Environment and the Economy, 1994.

6.4 Non-governmental Organizations

Non-governmental organizations represent a very broad range of interests that impact directly and indirectly on urban sustainability and their importance in achieving sustainability cannot be overstated. Making significant progress requires substantial changes to the way in which society functions and non-governmental organizations can play a key role to build consensus within various interests in support of change. Following is a selection of innovative institutions, developments and selected trends

under the following broad institutional categories - private sector, research institutes, local advocacy groups, national and provincial advocacy groups, educational institutions, media, and labour. This section does not represent a comprehensive overview of all of the institutions involved in promoting sustainability in Canada. Rather, the intent is to provide some indication of the nature of public policy development in Canada and to highlight some recent initiatives and institutions which provide support for measures which help develop sustainability.

6.4.1 Private Sector

Corporations play a vitally important role in promoting or hindering the development of urban sustainability. As with other developed nations, Canada's private sector consists of a wide range of organizations, from huge multi-nationals with annual sales in the billions, to medium-sized and local businesses which employ the majority of Canadians and are the primary source of new jobs. Traditionally, the corporate sector has responded to two driving forces of environmental change: the fear of financial loss stemming from non-compliance with formal requirements and the need to manage the natural resources upon which the businesses directly depend. Increasingly however, as the utilization of environmental management systems becomes more common, companies are recognizing that considerable benefits may be derived from improved environmental performance. These advantages include improved employee morale; greater efficiencies of production - 'waste is lost profit'; savings from energy efficiency; new product development; free advertising of environmental accomplishments; improved investment potential as lenders increasingly equate environmental performance with excellent all round management; and improved public perception which can lead to higher sales.

The Canadian Chamber of Commerce has been promoting the adoption of environmental management systems and pollution prevention, among small and medium sized enterprises through its *Focus 2000* program. The 1994 *Canadian Environmental Management Survey* by KPMG Environmental Services involved a survey of 1,000 of Canada's largest corporations, universities, municipalities and school boards on the state of environmental management. It reported that 49 per cent of respondents considered environmental issues important in their organization's overall planning activities, 76 per cent reported that they had established an environmental policy, 69 per cent reported that they had a management system in place to deal with environmental matters, three per cent of which had all of the vital components required. The conclusions which may be drawn from the study are that considerable opportunities remain for Canada's private sector to exploit business benefits from environmental management systems, pollution prevention, energy

efficiency, water efficiency and solid waste reduction.

In business support professions, like banking, accounting, and auditing, Canadians are among the world's leading innovators. Efforts on the part of the private sector to improve its environmental performance are being supported through the work of the Canadian Standards Association, which, through a multi-stakeholder approach, is developing generic standards in areas such as environmental management systems, environmental auditing, risk assessment, and corporate environmental reporting through the International Standards Organization. The Canadian Institute of Chartered Accountants and the Canadian Comprehensive Auditing Foundation have been conducting important research on the feasibility of full cost accounting, corporate environmental reporting and accountability frameworks on the environment. The Conference Board of Canada has over 700 Associate organizations from across Canada including corporations, trade unions, and industry associations. Among its many functions, the Conference Board conducts valuable and well-respected public policy analysis in the areas of education, environment, taxation and trade.

Other industry associations have been aggressively promoting improved environmental performance as a means to greater competitiveness. Examples include the Canadian Chemical Producers' Association's Responsible Care Program which encourages the use of environmental management systems for its members. At the community level, local Chambers of Commerce often play a vital role in providing input to the formation of public policy at the municipal and provincial orders of government.

The development industry, represented in part, by the Urban Development Institute, often exercises an important influence over the municipal development process.

The Imagine Program, initiated by the Canadian Centre for Philanthropy in 1992, has been promoting individual and corporate volunteerism across Canada. The program encourages companies to adopt a policy of donating a minimum of 1 per cent of average, domestic pre-tax profits and to provide opportunities for employee volunteerism and donations to charities. Some corporations have begun to build community service provisions into their employment contracts by permitting employees time from their work to perform community services.

6.4.2 Research Institutes

There exists a broad range of research institutes whose activities exert varying degrees of influence on the policy development process. These organizations range from those which provide detailed policy research, analysis and reporting on specific matters in a proactive manner, to those whose activities generally respond to government requests for specific input. An increasing number of these research institutions are of a cross-sectoral nature. Those dealing with issues of sustainability may be housed within the existing research activities of a university, others are funded directly by the Canadian or foreign governments, or through private sector and/or independent foundations. Selected research institutes focusing on issues directly relevant to urban sustainability include: the Canadian Urban Institute; the Canadian Institute for Environment Law and Policy; the Canadian Environmental Law Association; the University of British Columbia's Task Force on Healthy and Sustainable Communities; the Canadian Institute for Transportation; the Canadian Centre for Public Policy Alternatives; the Canadian Institute for Urban Studies; the International Institute for Sustainable Development; the International Centre for Local Environmental Initiatives; the International Development Research Centre; the International Centre for Sustainable Cities; and Ottawa University's Institute for Research on Environment and Economy.

6.4.3 Local Advocacy Groups

Local advocacy groups play an active role in promoting urban sustainability in communities across Canada. Indeed, the rapid growth of many small, 'grass roots' organizations continues to have an important impact upon public policy at all orders of government. These organizations range from single issue, 'pesticide action league groups', to Healthy Communities which organize activities to promote community health (broadly defined) and Local Round Tables which develop community sustainability plans and strategies. Many of these environmental groups are members of provincial or regional networks which together, often have the ability to influence provincial government policies. Provincial networks are joined together by the Canadian Environmental Network (CEN) which has over 2,000 member organizations. CEN serves to coordinate actions, collect and disseminate information on environmental developments nationwide and facilitate discussion on a wide range of issues.

Support for local community advocacy groups may come from membership, municipal, provincial or federal governments; special local bodies; the private sector or a variety of trusts and endowment funds. Local advocacy groups provide

considerable value to local governments given their ability to lever considerable community volunteer resources from what is often a minimal level of funding. During the workshop held to solicit input on the challenges and opportunities of urban sustainability, one municipal councillor remarked that for an investment of several thousand dollars into a local environmental committee, his municipality was able to greatly improve communications with its constituents on important environmental matters and lever community involvement in projects to improve the environment. One interview respondent, commenting on the role of local advocacy groups, stated that municipal governments can't get ahead of their populations, unless they have solid environmental non-government organizations bringing their constituents along. In addition to educational activities and direct action, the National Round Table on the Environment and the Economy (NRTEE) in its publication, *Discussions on Decision-making Practices For Sustainable Development*, recommends the establishment of a Citizen's Environmental Advisory Council to review municipal actions and issues from an environmental perspective and to draw upon the knowledge and expertise of citizens to assist in the ongoing communication with other constituencies (NRTEE, 1991).

Municipal governments often provide financial support for community groups focused on other important issues such as safety, crime prevention, and a variety of health related issues. In 1988, the federal government and the Canadian Institute of Planners, the Canadian Public Health Association and the FCM funded the development of the Canadian Healthy Communities Project, which operated a resource centre linking healthy communities across the country for three years.

The project has since been decentralized, becoming a network supported by resource centres located in the provinces and the Canadian Healthy Communities Network (CHCN). CHCN provides support to provincial and local networks and coordinates advocacy approaches to the federal government and agencies.

The key principles of the healthy communities movement, which involves over 1,000 communities world-wide, are: collaborative partnership among community residents of diverse disciplines and sectors; empowerment of community residents to direct their overall 'health' or quality of life; and the involvement of municipal government officials as key participating players. Healthy communities are provided with information which enables them to carry out a wide variety of projects to improve the health of their communities, from providing support services to the elderly to lobbying municipal governments for non-smoking bylaws. Several hundred communities across Canada participate in Health Community initiatives. A list of the national and regional contacts in the Healthy Communities movement is provided in Appendix II.

6.4.4 National and Provincial Advocacy Groups

National and provincial advocacy groups cover a wide spectrum of economic, social and environmental issues. These include the National Anti-Poverty Organization which represents over 150 local groups, including churches, food banks and women's shelters, who lobby against further cut-backs to social welfare programs, to Greenpeace and Friends of the Earth, who lobby for greater environmental protection through stricter government regulations and improved enforcement. Many of these national and provincial organizations receive funding from government sources and, as such, have been particularly vulnerable to increasing cut-backs in government financial support for special interest groups. Of those receiving most of their financial support from memberships, many have experienced declining revenues over the course of the recession as individuals have cut-back on their support. As a consequence, many groups have had to scale down their operations at a time when Canadian governments have widely incorporated public consultation into their policy development processes. In addition to lobbying, many non-governmental organizations provide valuable public policy expertise to government, on a contract and non-contract basis. For some as organizations, this is their primary activity.

The effect of national advocacy groups on policies concerning urban sustainability is perhaps most keenly felt in the social domain. This is largely due to the fact that the environmental movement has traditionally been focused on the preservation of remaining wilderness areas in Canada, not on urban environmental issues (although this is changing); and that provinces have a greater amount of power over environmental matters than the federal government. The focus of nationally-based social advocacy groups on federal areas such as social assistance, health care, taxation, transfer payments to the provinces, affordable housing, daycare and other issues has a direct impact upon the social sustainability of urban regions.

Many national organizations are also part of larger, international organizations and therefore help Canadians develop an international perspective on sustainable development. The Foster Parents Plan of Canada, for example, has over 300,000 Canadian foster parents who financially support and communicate with foster children in developing countries. The World Wildlife Fund Canada alerts Canadians to international environmental conservation and protection issues.

The motivation and objectives of national and provincial advocacy groups vary. While some are buoyed by their members' desire to improve the quality of life in their communities, others have a direct professional stake in the issues they address.

Associations such as the Canadian Medical Association or the Canadian Hospital Association, for example, will lobby the government on policy issues concerning the provision of health care. As another example, the Canadian Institute for Planners (CIP) is a national organization which promotes excellence in planning, sets membership standards, enforces a code of professional conduct and accredits university planning programs. The CIP has a membership of over 4,500 and is involved in research and lobbying activities. It has embraced the concept of sustainable development and has actively been working to promote urban sustainability concepts among its profession and before governments.

National and provincial advocacy groups play an important role in the development of public policy by representing broad public interests before policy makers. They provide valuable research and 'grassroots' information to governments about the effects of existing legislation, recommendations for new policies and assessments of the possible impact of new policy proposals. While many of these organizations, particularly those which are of a professional nature, are strongly supported by their membership, a large number stand to be adversely affected by existing and future government funding cuts.

6.4.5 Educational Institutions

Nearly all of those interviewed for the Overview felt that education must play a greater role in promoting urban sustainability. While significant progress has been made in alerting individuals to the general need to promote sustainability, these have generally not emphasized the connections between our ecosystems and individual actions and responsibilities. In the words of one participant, "It is time to move beyond the popular curbside recycling programs which exist in many communities." The lack of basic environmental literacy within Canadian society is reflected in a number of the values and beliefs described in Section 4.1, which stand as challenges to sustainability. The federal government, in partnership with a number of groups, is currently developing an environmental education strategy to increase the level of environmental awareness and action among Canadians.

Educational institutions are improving the level of environmental literacy among young Canadians. Of the three levels of education - primary, secondary and post-secondary - it appears that primary education is currently making the most significant progress in this regard. At the secondary level, efforts are also underway to improve the level of environmental literacy among youth by integrating environmental matters into the curricula and emphasizing the interconnections between subject areas. These efforts have recently been supported by the federal

government's Environmental Citizenship Initiative, which has resulted in the production of several resource books for the teaching community. *A Primer on Environmental Citizenship* provides general information on a wide variety of sustainable development issues. Also under the Initiative, more detailed information is available in primers on Fresh Water, Global Warming, Ozone Depletion, Spaces and Species and Waste Management. Secondary schools in Canada often have outdoor educational facilities which allow students to integrate science and technological studies with the environment through field world, such as water quality testing in local streams and ponds or studying environmental sciences directly.

In addition to formal primary and secondary educational institutions, other organizations play an important, informal educational role. These include the groups such as the Boys Scouts Club of Canada, which has been running a large scale tree planting program in co-operation with the private sector. The Girl Guides of Canada promote storm drain marking which involves the painting of fish silhouettes on roads near storm drains to dissuade residents from illegally dumping wastes. Many local volunteer organizations enter into partnerships with neighborhood schools to promote environmental literacy, health, and social responsibility through educational activities.

An independent, not-for-profit, multi-stakeholder organization called Learning for a Sustainable Future has been developing and implementing programs to integrate the concepts and principles of sustainable development throughout the primary and secondary school systems across Canada. They have developed a draft document, *Co-operative Framework for Sustainable Development Education* in order to promote discussion on the implications of sustainable development education. The draft has recently been circulated to over 500 stakeholders throughout Canada for discussion and comment.

The federal government is currently sponsoring the development of a national social change program under the leadership of the NRTEE and ParticipACTION, a private, non-profit corporation establish in 1971 to promote fitness in Canada. The social change program will be designed in as a major communications/participation program to promote understanding of initiate a national dialogue on environment and economy integration and promote attitudinal changes which contribute sustainability.

Post-secondary educational institutions have also begun focusing attention on sustainability issues. Over 12 universities have recently-established sustainable development research institutes. Almost 40 programs at the graduate and undergraduate level relating to cross-disciplinary degree programs in environmental sciences, environmental studies and sustainable development are now being offered.

The University of British Columbia's Sustainable Development Research Institute is responsible for coordinating the Canadian Centres for Sustainable Development, established in 1993 to improve the level of co-operation between research institutes and promote further research on sustainability.

6.4.6 Media

The media has a fundamental influence on the values and beliefs of Canadian society. The news media in particular, has clearly exercised a vital role in promoting concern for the environment and awareness of environmental, social and economic issues in Canada. The media and accompanying advertising, also has the ability to influence the priorities of policy makers and to shape cultural and social values and expectations. In so doing, the media exerts a direct and indirect influence upon the dynamic interplay between various competing interests within the political arena over policies directly relating to urban sustainability. Specifically, the media has the ability to:

- Lower or raise the public profile of issues, mobilizing public concern.
- Determine which voices will be heard in the public debates - environmental groups are accorded much more legitimacy now, than they were in the 1960's.
- Influence how the public perceives issues by framing issues as economic or social, personal or political (Fletcher, Stahlbrand, 1992 in Boardman ed., *Canadian Environmental Policy: Ecosystems, Politics and Process*, 1992).

In Canada, the federal government has regulatory authority over broadcast media. The federal government provides funding for the Canadian Broadcasting Corporation (CBC) a crown corporation which provides television and radio services to Canadians in both French and English, and acts a vehicle for the expression of a wide variety of Canadian cultural values. The provinces of British Columbia, Saskatchewan, Ontario and Quebec support educational television networks, while others purchase time on existing networks for educational programming. There are a variety of private sector broadcasters, which are regulated by federally by the Canadian Radio-television and Telecommunications Commission (CRTC). The CRTC is responsible for all federally chartered telecommunications carriers and the regulation and supervision of broadcasting in Canada. The Commission hears applications for new radio and television broadcasting licenses, including those for the CBC, pay and specialty television and locally-based cable television. The CRTC regulates the content of broadcasts to ensure a minimum level of Canadian-based programming

and hears public complaints about the performance of broadcasters, typically when they apply to renew their license.

A number of organizations, such as Media Watch, monitor media broadcasts to, for example, record the level of violence or the representation of minorities and women. Given the multi-cultural nature of Canada's larger urban regions, the media's portrayal of minorities has important implications for matters such as race relations. The state of race relations helps to determine the degree of liveability with Canadian cities, which have become increasingly racially diverse over the past 20 years. There are currently no organizations which systematically monitoring media reporting on the environment and sustainability issues.

More than 900 English-language community newspapers exist in Canada and almost 200 community newspapers are published in French. Of these, roughly half are owned by the large media companies such as Torstar Corporation, Southam Inc., Maclean Hunter, Thomson Newspapers Corporation, and Quebecor Inc., as well as some smaller firms such as Newfoundland's Robinson Blackmore, which publishes 14 community newspapers. Community newspapers generally cover local issues and provide an important forum for the discussion of local policies and issues, which for the most part, are not covered by the national or provincial media.

Canadians are also subjected to an overwhelming amount of American-based media, in the form of television broadcasting, print and cinema, over which they have little control.

6.4.7 Labour

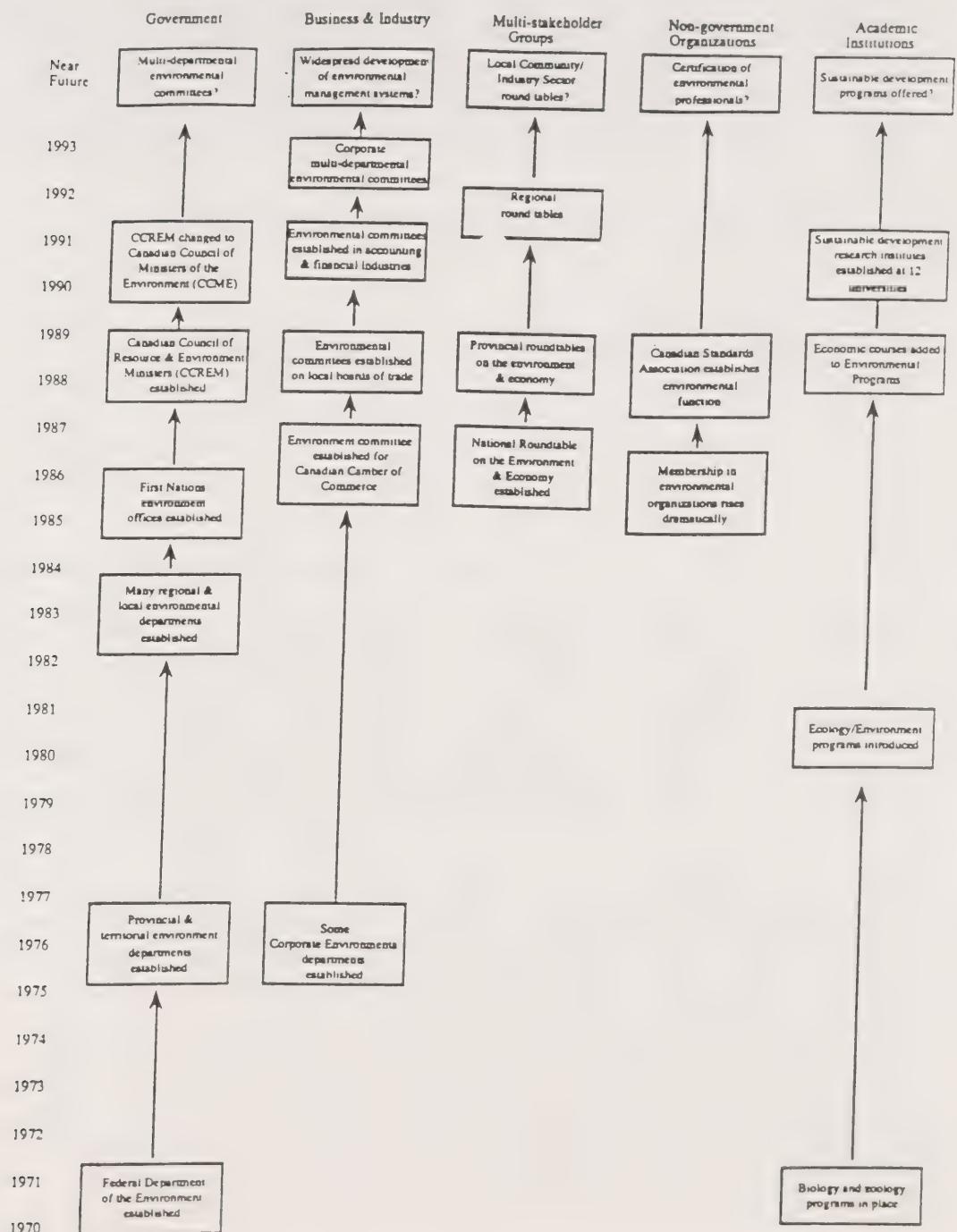
Environmental concerns have been addressed by the Canadian Labour movement for several decades, largely in response to worker concerns over health and safety. Many unions have established environmental committees to promote cooperative approaches between management and workers in order to increase environmental awareness and address specific environmental issues. In 1993, the Canadian Labour Congress (CLC), which represents over 2 million unionized workers, collaborated with the National Round Table on the Environment and the Economy to develop a manual entitled, *Sustainable Development: Getting There from Here, A Handbook for Union Environment Committees and Joint Labour-Management Environment Committees*. It provides an overview of major environmental problems as well as environmental issues in the workplace, and provides suggestions to establish co-operative measures between labour, environmental groups and management to solve a variety of these challenges. The CLC has officially endorsed sustainable development.

The Labour movement is active on a number of social issues from reforming taxation and provision of strong social insurance and security programs to international development, health and education. Organized Labour actively lobbies provincial and federal governments in Canada in pursuit of public policies which redistribute income. Canada's Labour movement plays an important role in advocating for government support programs which maintain critical elements of social sustainability. Conversely, Labour may represent a challenge to structural shifts in the economy which support sustainability insofar as the 'environment versus jobs' paradigm remains a dominant way of thinking.

6. 5 The Evolution of Canada's Institutional Framework

This section provided a fairly general overview of the institutional framework in Canada as it relates to the social, economic and environmental dimensions of urban sustainability. Section 7 involves a more detailed examination of the issues surrounding the inter-relationships and integrative institutions within Canada's institutional framework. Figure 14, on the following page, illustrates the evolution of the integration of the environment into selected Canadian institutions.

Figure 14: Environmental Evolution of Canada's Institutional Framework



Source: *Canadian Council of Ministers of the Environment, 1992*

"It is widely assumed that environmental issues can be dealt with in the same way as other government activities. But the complex inter-relationships demand holistic thinking and a new multi-level, multi-organizational approach - presenting a challenge to traditional government organization and management structures."

J. D. Stewart, 1991.

7 INTERGOVERNMENTAL RELATIONS: SELECTED INSTITUTIONS AND ISSUES

The following is a description of some of the principal integrative institutions and issues which inform intergovernmental relations. In addition to the more traditional integrative structures, a number of relatively new institutions whose principal activities deals more directly with urban sustainability are also described. Several of these institutions represent models which could be further utilized to overcome some of the institutional barriers described in Section 4.

7.1 Federal-Provincial Government Relations

The search for areas of agreement between the provinces and federal government over the division of powers and the creation of new agreements is a defining characteristic of Canadian political life. The constitutional ambiguity over the division of powers relating to the environment and other areas of public policy has led to a dramatic range of mechanisms for facilitating intergovernmental relations over the last twenty-five years. Several key issues arising from the uncertain division of powers for the purposes of developing ecological cities are:

- Provincial authority over the establishment of municipal government structures and the delegation of power to these governments convey a central role over the development of ecological cities to provincial governments. To some extent, the decentralized federal system provides for greater flexibility of municipal government structure and function to better reflect local conditions. Provincial authority over municipal governments provides greater access to a wide range of important decision-making processes than municipal governments might otherwise have in a national-municipal system. Provinces are also better able to establish more applicable environmental policies and regulations than would otherwise be possible, given the diversity of geographic, economic, cultural, climatic conditions, and local institutional structures in Canada.

- The federal government plays a direct and indirect role in determining the social, and economic climate in which municipal governments are able to function. Direct municipal government input into federal policy development is however, not fully integrated into many of the current policy development processes and intergovernmental institutions. Moreover, the federal government does not, for example, have a Department of Municipal Affairs or national policies pertaining specifically to urban matters. It sought to enlarge its role in urban affairs in the late 1960's and early 1970's, but was vigorously opposed by provinces like Quebec and Ontario who saw this as an encroachment upon their direct jurisdiction.
- Many environmental matters overlap between federal and provincial jurisdictions. Historically, this has resulted in a range of intergovernmental arrangements and situations which include:
 - conflicting sets of legislation and standards with federal legislation taking priority and provincial standards, if they are more stringent, dominating in some cases;
 - the delegation of selected powers to each others' agencies;
 - environmental legislation existing in only one jurisdiction;
 - the unwillingness of one or both orders of government to accept jurisdictional responsibility;
 - agreements which allow one government to take a lead role while consulting the other;
 - the delegation of enforcement and monitoring functions (primarily from the federal government to the provinces);
 - direct federal-provincial conflicts over the applicability of federal legislation, often as it pertains to provincial resource development; and,
 - power sharing and joint policy development through negotiated agreements.

Intergovernmental relations have been marked by periods of co-operation and competition over environmental matters, fueled to some extent by the desire of provincial and federal politicians to respond legislatively to growing public environmental concerns. Tensions and sensitivities between provincial and federal governments continue, but have been greatly mitigated through new institutional arrangements and a willingness on the part of the federal government to restrain its desire to become more active in areas provinces regard as their jurisdiction (Skogstad, Kopas, *Environmental Policy in a Federal System: Ottawa and the Provinces*, in Boardman, 1992).

Federal - provincial relations over social and economic programs and support are constantly evolving and involve numerous bilateral and multilateral agreements between the provinces and the federal government, many according to the similar general frameworks described above. Areas of disagreement between provinces and the federal government are diverse and vary by province. Issues of a broad nature that remain contentious often centre on the level of transfer payments to the provinces; jurisdiction over matters such as labour, and training and health care; and international trade agreements, most notably the *Canada - U.S. Free Trade Agreement* and the *North American Free Trade Agreement*. The following are some of the principal institutional frameworks which facilitate federal-provincial co-operation and co-ordination.

7.1.1 The Canadian Council of Ministers of the Environment

The establishment of the Canadian Council of Ministers of the Environment (CCME) as a permanent Secretariat in Winnipeg, Manitoba in 1989 has contributed greatly to improved intergovernmental relations on environmental matters. The CCME is made up of Environment Ministers from the federal, provincial and territorial governments who normally meet twice a year to discuss national environmental priorities and develop policies to be carried out under the auspices of the CCME. Two steering committees, made up of senior staff from each jurisdiction, provide ongoing policy advice and co-ordinate specific projects such as the National Contaminated Sites Remediation Program. The CCME has established task groups to work on a broad range of environmental issues and to help clarify the roles and responsibilities of each order of government. Task groups have been formed in areas such as: packaging; air quality issues including global warming; acid rain; ground level ozone and smog; waste management; and integrating economy and environment. Much of the CCME's work is aimed at developing a consistent and co-ordinated approach among governments to set national environmental legislation, regulations and policies, where possible. A current priority is the harmonization of environmental legislation and standards. Working in partnership with the FCM, the CCME recently produced a document, *A Municipal Primer on the United Nations Conference on Environment and Sustainable Development*, which outlines various approaches through which municipal governments may address the goals of UNCED and provides a valuable list of case studies.

Traditionally, municipal sustainability issues have not been directly addressed by the CCME. The absence of municipal government representation within the CCME, coupled with the federal government's lack of direct jurisdiction over urban affairs and provincial resistance to municipal participation in provincial-federal relations, are often cited as the primary reasons for this.

"The number and scale of matters that transcend municipal boundaries - including watersheds, the Oak Ridges Moraine, waterfronts, foodlands, and transportation among others - is growing. They require a level of co-ordination among municipalities that is hard to achieve without provincial leadership."

RCFTW, Planning For Sustainability: Towards Integrating Environmental Protection into Land-Use Planning, 1991.

7.1.2 The Intergovernmental Committee on Urban and Regional Research

The Intergovernmental Committee on Urban and Regional Research (ICURR) was established in 1967. It is made up of senior officials from the federal government, provincial and territorial government's who meet regularly to oversee ICURR activities, primarily the operation of an information exchange service and research. ICURR receives core funding from CMHC and provincial governments, on a *per capita* basis. Its main objective is to foster communication between policy makers in the fields of urban, rural and regional planning, economic development, public administration and finance, housing, recreation and tourism, transportation, and the environment. The Board of Directors, which consists of provincial and federal public servants, establishes the research agenda within these parameters. Neither municipal governments nor local government associations sit on the Board of ICURR. They may, however, become members of ICURR for a membership fee which grants them access to ICURR databases and the ability to borrow materials from ICURR's resource library. ICURR has published a number of important research papers on urban sustainability in Canada, many of which are referenced in this Overview.

7.1.3 National Air Issues Steering Committee

The National Air Issues Steering Committee (NAISC) was established in 1993 and consists of Deputy Ministers from the Environment and Energy Departments of the federal government and the provinces of British Columbia, Alberta, Ontario and Nova Scotia. The mandate of NAISC is to ensure national co-operation and co-ordination in the management of air quality and atmospheric issues. Its functions include: providing consistent strategic direction to the National Air Issues Coordinating Committee (NAICC) which consists of senior officials from Energy and Environment Departments of the federal, provincial and territorial governments; and consulting with other Deputy Minister committees to incorporate their views prior to making recommendations to Ministerial Councils via the appropriate Deputy Ministerial Councils. The decision-making process within NAISC is based on a consensus of those in attendance.

The NAICC operates within the framework of the Comprehensive Air Quality Management Framework Agreement and its responsibilities include:

- Improving co-ordination and co-operation on scientific, technological and economic activities in order to improve air quality and atmospheric management in Canada and the integration of government action on air issues.
- Providing advice to the federal government on negotiating positions and strategies for international air quality agreements on national air issues.
- Establishing processes for effective national stakeholder consultations with respect to the aforementioned items.
- Establishing supporting task groups, as necessary, to fulfill these responsibilities.
- Tracking progress in achieving emission reduction targets and other actions established in regional and national strategies as well as international agreements.

Under the terms of the Air Quality Management Framework, provincial, territorial and federal governments may negotiate multilateral and bilateral agreements on air quality issues which define their relative costs and responsibilities. The NAICC does not have membership from non-government stakeholders or municipal governments but meets with external stakeholders and receives advice from a non-governmental Advisory Group, as required, in order to ensure their access to decision-making. Among the task groups established under NAICC is the Climate Change Task Group which has been developing Canada's *National Climate Change Action Plan*.

7.2 Inter-provincial Government Relations

There are numerous issues which affect urban sustainability involving inter-provincial relations. Provincial co-operation over issues such as transfer payments from the federal government and the interpretation of the *Canada Health Act* improves their ability to influence federal government policies in these areas. Other issues, such as internal trade barriers, inter-provincial transportation infrastructure; and disputes over the negative environmental, social and economic impact of cross boundary pollution require federal assistance in reaching a solution. In these cases, the federal government may act as a mediator in the national interest. Provincial Premiers and

Cabinet Ministers from a number of portfolios meet regularly, either through the institutional structures such as those described above, or on a more informal, ad hoc basis. Progress is being made to harmonize laws and regulations in a variety of sectors in order to improve the mobility of labour and capital within the country and strengthen the common market. Before describing additional integrative institutional frameworks, it should be noted that within the Canadian political system, there are systemic, and other factors, which impede inter-provincial co-operation: These include:

- The high number of interests which may be involved in resolving an issue, such as the regulation of professional standards in fields like engineering and construction.
- Frequent provincial elections, which make it difficult to reach an agreement on complex issues before one or more of the stakeholders change.
- Different institutional frameworks involving departments and ministries which may have different structures, and crown corporations, and quasi-judicial and administrative boards.
- Different legislative frameworks in areas such as environmental protection, where several provinces may, for example, forbid the use of one type of material while others allow it to be used. A related example involves regulatory processes, where one province may grant decision-making power to an environmental assessment board, while another may only allow it to make recommendations.
- Strong vested interests in one or more provinces seeking to obstruct the reaching of an agreement - this is generally more important on single issues negotiated on a bilateral basis.
- Different political agendas among the provinces, strengthened by differences among political parties, and cultural and regional diversities.

7.2.1 The Committee of Ministers on Internal Trade

The Committee of Ministers on Internal Trade (CMIT) was established in 1987 by the Prime Minister and Canada's First Ministers with a mandate to take immediate steps to eliminate barriers to inter-provincial trade, and to report on the status of internal trade in Canada and issues that may limit trade between the provinces. The CMIT consists of ministers from both federal and provincial orders of government

who are responsible for internal trade and economic development. Provinces have the power to establish restrictions on internal trade, estimated to be worth roughly \$90 billion in 1988 (in 1994 dollar producer prices), and accounting for about 2 million direct jobs in 1990. Total inter-provincial trade is dominated by Quebec and Ontario which account for approximately two-thirds of all trade between the provinces. However, inter-provincial trade accounted for a higher proportion of production in the Maritime provinces, Alberta and Manitoba than it did in British Columbia, Ontario or Newfoundland where its share of total production is relatively small. Inter-provincial barriers to trade have been established since Canada's confederation and have direct economic consequences in terms of Canada's Gross National Product. The value of this loss which has been estimated to be as high as \$4 billion annually. CMIT deals with important trade-related issues such as labour mobility between the provinces, provincial procurement, the reconciliation of regulatory frameworks and standards across a number of sectors, investment competition, consumer-related standards, and transportation. Improved intergovernmental co-operation in these areas is likely to increase government efficiency; improve access to a larger domestic market for companies; enhance private sector competitiveness; and increase stability for effective long-term investment decisions for businesses.

Canada's emerging environmental industry is one of many industries which stand to benefit from progress in these area of the harmonization of provincial environmental legislation. CMIT, ministers from other sectoral provincial and federal departments such as transportation, agriculture, environment concluded negotiations on an *Agreement on Internal Trade* which was signed by First Ministers in July, 1994. While the Agreement does not include a number of important sectors, such as the financial industry, it stands as a historic achievement in intergovernmental co-operation which promises to strengthen Canada's overall economic performance and improve the ability of skilled workers to migrate between urban centres in different provinces.

7.3 Federal - Municipal Government Relations

Federal municipal-relations are for the most part, conducted through the FCM which is described below. Under some circumstances, provinces will allow federal governments to work directly with a municipal government on a specific project, often when the project does not involve the transfer of direct financial resources. Federal government departments and agencies typically request the permission of the provinces to deal directly with a municipal government, or ask that the province participate through some form of multilateral agreement.

7.3.1 The Federation of Canadian Municipalities

The Federation of Canadian Municipalities (FCM), is the sole national voice of municipal governments in Canada. Founded in 1937, FCM represents 70 per cent of the population through 560 municipalities of all sizes and types across Canada, as well as all of the major territorial and provincial municipal associations. FCM provides a national forum for the exchange of views and experiences among Canada's municipal leaders. Programs and policies are determined by a National Board of Directors comprising 65 elected municipal officials. Policy recommendations are developed by Standing Committees and Task Forces in areas such as Environment, Municipal Finance, Housing and Constitutional Affairs, and National Transportation. Through its publications, meetings and conferences, FCM keeps municipal governments aware of national issues which may affect them, develops policies and represents municipal interests before federal Ministers and Members of Parliament. The FCM is funded by the support of its municipal government members, and also has more than 100 supporting members comprised of private sector and governmental organizations. The federal government relies upon FCM to represent municipal interests through participation in a variety of special Task Groups, Committees and Advisory groups across a broad range of issues from global climate change to urban crime. The FCM also actively participates in the dissemination of federal information support to its members. The FCM was successful in obtaining federal government support for a \$6 billion, cost-sharing infrastructure program for projects such as road and bridge repair and waste water treatment. The recent infrastructure project provides an example of intergovernmental co-operation among all three orders of government, each of which is responsible for contributing \$2 billion to the program.

7.4 Provincial - Municipal Government Relations

The relationship between provincial governments and municipal governments is primarily a function of history, technology, politics and finances. In some provinces, municipal governments are given considerable authority, while in others, their activities are more closely controlled. Legislation which empowers municipal governments is of two types, 'exclusive' or 'inclusive'. The exclusive form of legislation only allows municipal governments to do what it specifies. Inclusive forms of legislation allow municipal governments to carry out any functions that fall outside the realm of the federal and provincial orders of government. Inclusive legislation is utilized in Alberta and provides municipal governments with the ability to respond more quickly to the rapidly expanding and changing governance demands they face, without having to wait for time consuming amendments to legislation which are required under exclusive forms of legislation.

Provincial governments provide a range of support services to municipal governments which include financial support in the form of conditional and unconditional grants for service delivery. Each municipal government works out financing agreements to deliver services with its province. Provincial control over municipal finances includes the authority to limit their capital borrowing. Municipal government grants may be short or long term in nature, and if conditional, may force municipal governments to pursue a course of action which does not necessarily suit local circumstances. The ability of larger provinces to set province-wide standards is often constrained by the scope of municipal government and wide diversity of local situations which exists. Provinces have considerable freedom to delegate administrative functions, (only those within their constitutional authority) or to devolve jurisdiction and full responsibilities to their municipal governments.

Issues of jurisdictional authority and policy implementation are tied closely to the issue of municipal finance. A common concern among municipal governments is that provincial policy changes, directly or indirectly, will impose costs upon them which they cannot reasonably meet. Proponents of municipal government empowerment often make the case that provinces should set broad policies and municipal governments should deliver services, since they are close to the community and more directly accountable and responsive to their constituents.

The degree to which provinces delegate powers and responsibilities is constantly evolving. Compared to many European local governments, Canadian municipalities are relatively weak and therefore less able to implement many of the changes required to establish ecological cities. This is a brief summary of some of the main factors that contribute to the relatively low level of power of municipal governments within the Canadian political structure. Factors which limit municipal government authority typically include the following:

- The territorial boundaries of existing municipal institutions, particularly in large urban regions, often make it difficult for Tier 2 and Tier 1 municipal governments to establish effective urban policies. The Municipality of Metropolitan Toronto, Ontario, for example, is affected by a 'commuter shed' which extends well beyond its existing borders into four other regional municipalities. Effective transportation planning is not possible without a high degree of integration which does not currently exist.

- Provinces establish numerous special-bodies to deliver local services. These typically include school boards, hospitals and community colleges which report to the provinces, but often have a direct impact on the level of municipal finances. In British Columbia, for example, there are over 553 local government entities with specialized mandates. These include water communities, school districts, hospital districts, and improvement districts (BCRTEE, *Strategic Directions For Community Sustainability*, 1993). Fragmented responsibilities and accountability among local institutions makes it difficult for municipal governments to pursue integrated policies which cross over a range of local government functions.
- The large number of municipalities in urban regions, their various departments, and special bodies each with its own territorial scope, make it difficult to establish cross sectoral policies over ecosystem-based parameters such as watersheds. Several individuals interviewed for the Overview commented that there is simply too much overlapping bureaucracy at the local and regional municipal government level.
- Interest groups, such as developers, and special bodies, such as school boards, have vested interests in limiting municipal powers which include matters such as making sure that land development decisions at the municipal level can be appealed provincially.
- Municipal governments, even during the recent reform movements of the 1960's and 1970's, have been reluctant to make the case for increased authority from the provinces, partly due to concerns about their ability to finance additional services.
- Some provincial bureaucracies have a vested interest in maintaining considerable power over special purpose bodies, who report directly to them, as well as exercising an approval function in areas such as municipal land-use decisions, waste management and program funding.

These factors suggest that the provinces will continue to exercise primary jurisdiction over many of the fundamental matters pertaining to urban sustainability. By itself, increasing the authority of municipal governments is unlikely to result in significantly greater progress toward urban sustainability. The devolution of powers to municipal governments, without significant changes in the level of municipal revenues could even hamper progress in certain areas. While there is a role for the devolution of provincial powers in promoting urban sustainability, to effectively promote sustainability, reforms must also address the structure of municipal government

finances and the impact of the number and territorial boundaries of existing local governance institutions. A first step for Canadian policy makers is to begin integrating sustainability considerations into the process of local government evolution. Narrow economic considerations and political considerations have traditionally been the impetus for reform. The framework for State-of-Institutions Reporting described in Section 5.3 may provide some guidance in beginning to establish new institutional arrangements that build upon provincial and municipal government capacity to promote urban sustainability.

7.4.1 Provincially - based Municipal Associations

Municipal governments in each province and the Yukon Territory have formed associations to represent their interests before their provincial or territorial governments. In some provinces, such as Alberta and New Brunswick, several Municipal Government Associations exist, divided along rural and urban interests represented by different categories of municipal government. Municipal governments have a range of concerns which require collective representation before the provinces. Foremost among these are unconditional levels of funding, broad-based funding programs with specific requirements, and the adoption of legislation that may have a direct impact on municipal government finance. Municipal associations also may play a vitally important role in advising the province about issues concerning the potential impact of provincial government policy proposals upon municipal governments. Through conferences and workshops, municipal associations also help to educate and orient new local officials on provincial-municipal relations. Municipal governments also deal with the province on a bilateral and multilateral basis over issues such as amalgamations, funding programs, and issues of a regional nature which extend beyond municipal boundaries. Provincially-based Municipal Associations have an ongoing role to play in managing the evolving intergovernmental relationships between provincial governments and their municipal government members.

"We must slowly restructure all our institutions for greater interaction which is the basis of the principle of empowerment. A newer interactive governance pattern gradually emerges within each institution which involves all related constituencies in the community at large which the institution is designed to serve."

Fulton, 1990, in A Framework For State-of-Institutions Reporting, Fraser Basin Management Program, 1993.

7.5 Inter-institutional Integration

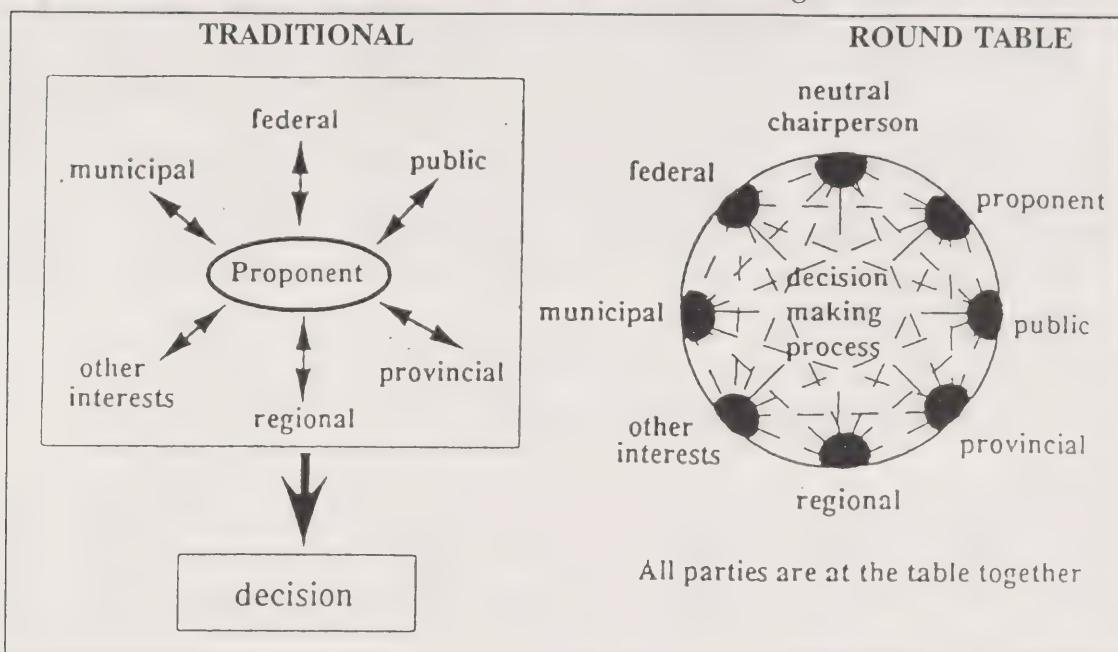
The growing recognition in Canada that traditional institutional structures cannot cope effectively with the challenges of sustainability has contributed to the formation of new institutions which perform integrating functions. One of the focus areas for the OECD's Project Group on the Ecological Cities centres on how to improve the role of institutions in promoting urban sustainability. The following highlights several integrating Canadian institutions and describes some of their plans and current activities.

7.5.1 Round Tables on the Environment and the Economy

The first multi-stakeholder, consensus-based Round Table was established in 1987 by the federal government. Since then, Round Tables on the Environment and the Economy have been established in all the provinces and territories, for specific sectors such as Energy and Forestry, and more recently, a number of Local Round Tables have emerged to develop sustainability plans for their regions. Round Tables are an important and valuable integrative institutional mechanism since their primary objective is to bring together a diversity of interests from different sectors of society to forge consensus on developing policy and programs that address what are often difficult and divisive sustainability issues.

Round Tables have been a positive catalyst for change through their work to develop and promote public policies in support of sustainability. They are founded upon the fundamental premise that sustainability requires concerted effort on the part of all members of society. Hence, various stakeholders are brought together (which have often included federal and provincial Cabinet Ministers), to develop a consensus on measures to implement sustainability. The Round Table approach to planning and decision-making is very different from the traditional, fragmented consultative approach. These differences are illustrated in Figure 15.

Figure 15: Traditional and Round Table Decision-Making Processes



Source: *Royal Commission on the Future of the Toronto Waterfront*, 1991

Round Tables have resulted in a valuable and insightful body of public policy knowledge on many important facets of sustainability specific to international, national, provincial and local ecosystems. The chair of the Manitoba Round Table on Environment and Economy (MRTEE) is the Premier, the Honourable Gary Filmon. MRTEE has recently completed province-wide consultations to assess the feasibility and value of enacting sustainable development legislation. *A Discussion Paper for a Sustainable Development Act* examines issues the legislative and institutional barriers to sustainable development in Manitoba with the intent of developing sustainable development legislation. It is envisioned that such legislation would ensure that sustainable development is embodied in the mandates, management systems, structures and operations of Manitoba's public sector.

Collectively, Canada's Round Tables have worked to improve our understanding and application of the consensus process to develop practices and policies that promote a sustainable future. *Building Consensus for a Sustainable Future: Guiding Principles*, described in detail in Section 5.6, was recently completed by Canadian Round Tables, the IISD, the Canadian Standards Association and the Niagara Institute. Round

Tables have made recommendations, primarily to the federal, provincial, territorial and municipal governments and the National Round Table on the Environment and the Economy provides regular advice to the Prime Minister on measures required to promote sustainability. The rapid growth of Local Round Tables across Canada has been invaluable in assisting communities in their efforts to establish long term plans and strategies to improve the liveability of their regions. This has helped to spawn an explosion in 'grassroots' activities which implement local projects such as stream restoration, tree planting, sustainable development days, and education. A list of contacts for the national, provincial and Local Round Tables in Canada has been included as Appendix II.

7.5.2 Fraser Basin Management Program

In June, 1991, the Ministers of Environment Canada and the Department of Fisheries and Oceans announced the establishment a six year, \$100 million Fraser River Action Plan (FRAP) to repair the environmental damage to the Fraser River Basin and to develop a management program to promote sustainable development involving partnerships. This initiative is part of Canada's National Green Plan, a six year national strategy and action plan for sustainable development introduced in December, 1990 by the previous federal government. The Fraser River flows 1,375 km, from headwaters in the Rocky Mountains to a massive delta passing through the GVRD, one of Canada's largest metropolitan regions. The drainage area is roughly 1/3 the land area of British Columbia. It is home to almost 2/3 of British Columbia's population and generates 80 per cent of the province's economic production - from mining and forestry to agriculture and fishery.

One of the original key goals of the FRAP was to establish partnerships. In May, 1992, under a joint agreement between federal, provincial, and municipal governments the Fraser Basin Management Program was established as a key vehicle for promoting partnerships. Its 19 member Board is drawn from all orders of government, industry, community and environmental organizations, and aboriginal groups. Numerous partnerships have been established to carry out a wide variety of activities over the Basin. The Board has been developing a sustainability strategy and regional institutions over 1993-1994 for the Basin and its watersheds. Activities under five strategic programs include:

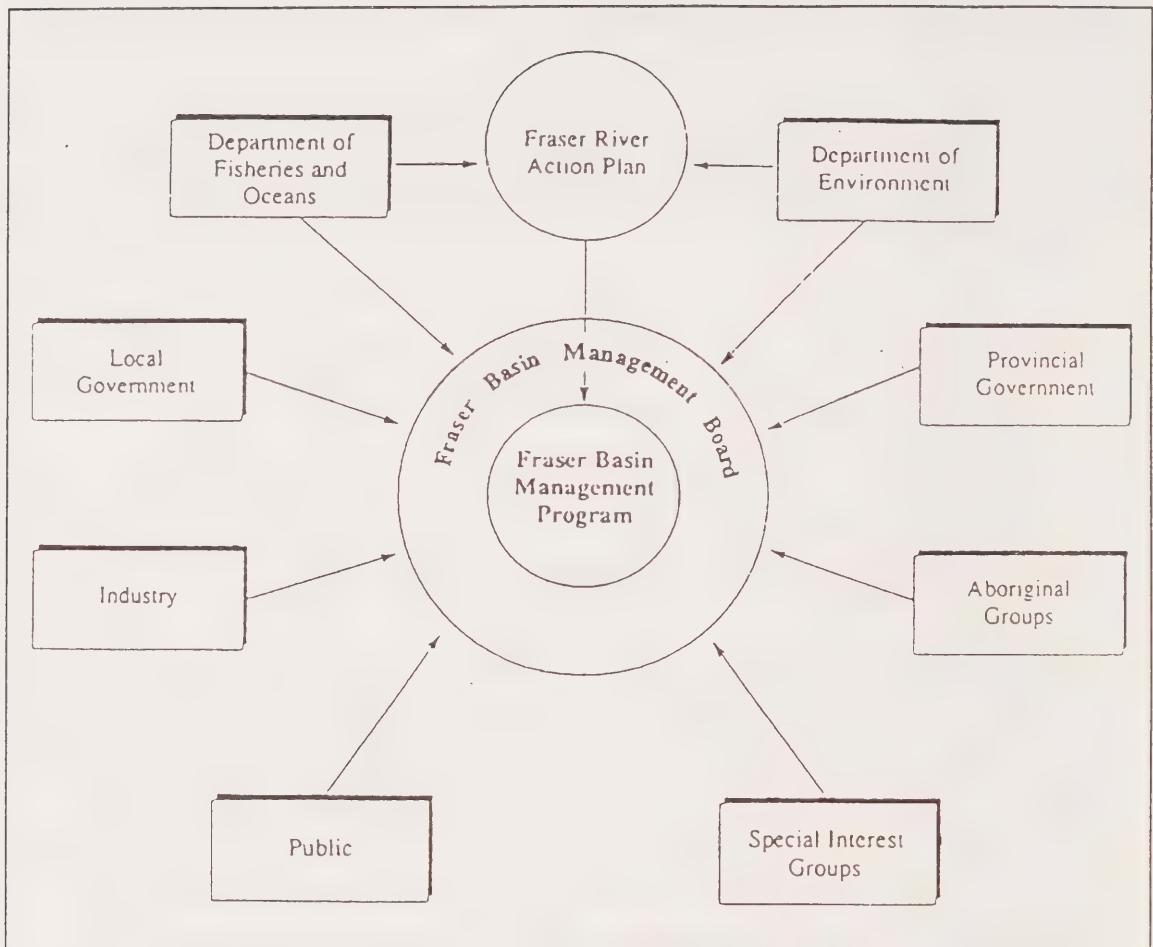
- Management Strategies. Multi-stakeholder steering committees were established to lead the development of management strategies and initial action plans have been adopted in four priority areas: water resources; fisheries and aquatic habitats; pollution prevention and waste minimization; and community development.

- Institutional Development. Options for initiating co-ordination and integration of management activities in the sub-basins have been developed and reviewed with stakeholders and an option based establishment of regional co-ordinators adopted.
- Demonstration Projects. From 34 submissions, 4 watershed and 2 corridor projects have been endorsed by the Board as demonstrations of ways in which non-government and government stakeholders can work together toward sustainability.
- Audits. Through multi-stakeholder steering committees and community workshops ways have been identified for remedying the critical gaps in strategies and institutions for sustainability management (Section 7.2 highlights some of the work on institutions in greater detail).
- Information, Communications and Education. In order to improve understanding of the Fraser Basin, sustainability issues, and activities of stakeholders, the Source Book - a compendium of information and a computer Bulletin Board Service have been developed.

The Fraser Basin Management Program plays an important integrating role in dealing with the complex and highly integrated challenges facing sustainability in the Basin, that can only be addressed through a high degree of co-operation among many different stakeholders. Figure 16 demonstrates the types of stakeholders brought together under the program. Focused government programs which include a strong institutional integrating function may be effectively utilized by the federal and provincial governments to help identify and overcome existing institutional barriers to sustainability.

Figure 16 illustrates the wide range of interests which are working together within the Fraser Basin Management Program.

Figure 16: Institutional Integration Under the Fraser Basin Management Program



Source: *Auditor General of Canada, 1993 Report*

7.5.3 Remedial Action Plans

The Great Lakes Water Quality Agreement (GLWQA) between the United States of America and Canada contains far-reaching commitments concerning the protection and restoration of water quality in the Great Lakes. The International Joint Commission (IJC) was assigned responsibilities to monitor and assess progress, particularly on the part of the two national governments, the Province of Ontario and the eight U.S. states in the Great Lakes basin.

In 1985, a recommendation of the IJC's Water Quality Board, later codified in the 1987 amendments to the GLWQA, called for the establishment of Remedial Action Plans (RAPs), for the 43 'areas of concern' identified around the Great Lakes. RAPs are currently being developed and implemented by representatives from the federal, state, and provincial governments, the private sector, organizations and citizens interested in restoring the local environment. The multi-stakeholder RAPs are unique because they utilize a community-based, ecosystem approach with top down support from governments. RAPs for the 43 "areas of concern" are at different stages in their development, but each must complete the following steps in the process:

- Quantitatively define the area's environmental problems, including the geographic extent of the area affected.
- Identify which beneficial uses are impaired - defined as a change in the physical, chemical or biological integrity of the Great Lakes system sufficient to cause any of 14 impairments. These include fish tumors; restrictions on fish and wildlife consumption; tainting of fish and wildlife flavour; bird or animal deformities or reproductive problems; added costs to agriculture or industry; restrictions on drinking water consumption, or taste and odor problems; beach closings; degradation of aesthetics; degradation of photo plankton and zoo plankton populations; degradation of benthos; restrictions on dredging activities; and loss of fish and wildlife habitat.
- Describe the causes of the problems and identify all known sources of pollutants.
- Identify remedial actions to restore impaired uses.
- Identify a schedule for implementing remedial actions.
- Identify jurisdictions and agencies responsible for implementing and regulating remedial actions.
- Describe the process for evaluating remedial program implementation and regulating remedial measures.
- Describe the surveillance and monitoring activities that will be used to track program effectiveness and eventual confirmation that uses have been restored. (Metro RAP, *Clean Water, Clear Choices*, 1994)

The RAPs have important consequences for urban regions around the Great Lakes. The recently completed RAP for Metropolitan Toronto and Region entitled, *Clean Water, Clear Choices*, contains over fifty specific recommendations, many of which are focused on storm water runoff and treatment, and improving sanitary sewage systems and sewage treatment facilities. The report calls for measures to include water quality considerations into land-use and transportation planning throughout the region and gives an estimate of the costs associated with each of its recommendations.

7.5.4 Waterfront Regeneration Trust

In June, 1988, the federal government established the Royal Commission on the Future of the Toronto Waterfront (RCFTW). It had a three year mandate to explore the role for the federal government in ensuring the economic and environmental viability of Toronto's waterfront. In October, 1989, the Province of Ontario endorsed the Commission's interim report and gave it a broader mandate which included making recommendations on: land-use planning on the waterfront; transportation; housing and community development; employment and job opportunities relating to the waterfront; and initiatives to preserve and enhance the quality of the environment and quality of life for people living in the entire region. The high level of federal-provincial co-operation over the RCFTW resulted in this being the second time in Canadian history that a Royal Commission has served two orders of Canadian government.

The Commission held numerous public consultations in the development and application of recommendations to promote sustainability within the Greater Toronto Area (GTA) bioregion. The GTA bioregion is an area with over 4 million residents; 250 kilometers of shoreline; 17 Tier 1 municipal governments; six Conservation Authorities; four Tier 2 regional municipalities; and four counties along its waterfront. The Royal Commission's pioneering work to develop an ecosystem approach to the management and regeneration of the GTA bioregion is based on nine central principles. A synopsis of these includes:

- Clean. All activities and future development should work with natural processes to contribute to environmental health. Air, land, sediments and water should be free of contaminants that impair beneficial uses by people and other living beings. Polluted soils, ground water, sediments, and water should be remediated. New development should include the best possible means of controlling storm water flows and pollution, reducing energy use for heating/cooling, minimizing automobile dependence, reducing and recycling wastes and reducing water consumption. Where possible, existing development should be adapted or retrofitted to achieve these goals.

- Green. Natural features and topography should form a 'green infrastructure' for the bioregion's cities, suburbs and countryside. A green infrastructure may include natural habitat areas such as wetlands and forests, land forms such as bluffs, valleys, beaches and cliffs; aquifer recharge areas; and parks and other open spaces. The diversity and productivity of ecological communities should be protected and restored through measures that:
 - preserve the genetic diversity of indigenous plants and animals;
 - protect and restore healthy natural habitats and communities; and,
 - maintain natural ecological processes.
- Connected. Major green corridors should connect the waterfront, valley systems, and the Oak Ridges Moraine; the waterfront should be joined by pedestrian and bicycle trails.
- Affordable. Parks and facilities on the waterfront should be financially available to all income groups, and waterfront residential projects should include affordable housing.
- Usable. Among other applications, the waterfront should continue to support a mix of public and private uses that are primarily water-related, and permit public access, use and enjoyment of the water's edge.
- Diverse. The waterfront should provide diverse experiences for visitors and residents, using a mix of open space and recreation facilities that balances public demands with environmental limits.
- Open. The design of waterfront structures should not create a visual barrier or be an intrusion on the water's edge, which should be identified clearly as open to public access.
- Accessible. All waterfront activity nodes and communities should be accessible by public transit as well as by road, with increasing emphasis on transit; they should also be accessible by foot or bicycle. The waterfront should be safe, and accessible to the disabled as well as to all other segments of society.
- Attractive. Waterfront design should consider vistas and views of the lake, sensible design of buildings, open spaces, micro climates, usable links, harmonious colours and textures, and natural as well as manicured landscape techniques (RCFTW, *Regeneration*, 1991).

The Commission has also developed a generic framework which combines elements of environmental assessment legislation with traditional land-use planning to establish an ecosystem approach to land-use planning which is described in detail in Section 5.5. This framework is currently being applied in over 60 projects across the Greater Toronto Area bioregion involving government and non-government stakeholders. These projects are currently implemented under the guidance of the Waterfront Regeneration Trust, a crown corporation recently established by the Province of Ontario to continue carrying on the work of the RCFTW after its original mandate expired. By currently focusing on implementing projects in the GTA bioregion, the Waterfront Regeneration Trust continues to build multi-stakeholder coalitions to support the further development and application of the ecosystem approach to land-use planning, while at the same time, testing, refining and further developing ecosystem management and planning concepts.

7.5.5 Projet de Société

Projet de Société was established in November of 1992 and is a multi-stakeholder partnership of government, indigenous peoples, business and non-governmental organizations committed to promoting Canada's transition to a sustainable future. Projet provides a national forum for bringing sectors and individuals together to build consensus and partnerships. The operating principles of Projet are:

- A process that is designed to be transparent, inclusive, and accountable.
- Each partner and each sector is encouraged to identify and take responsibility for its own contribution to sustainability.
- Dialogue and co-operation among sectors and communities are key elements of problem-solving.
- A shared vision and agreement on key policy, institutional, and individual changes are necessary for the transition to sustainability.
- Strategy and action must be linked, and must build on previous and ongoing initiatives.
- Canada's practice of sustainable development and its contribution to global sustainability should be exemplary.

The Projet, which has representatives from over 80 sectors, including seven federal departments, six provincial ministries, has drafted a *National Sustainable Development Strategy* (NSDS). The Key elements of the approach within the NSDS are:

- Defining a collective vision and shared values of sustainability.
- Developing a policy framework that builds on and links together federal, provincial, sectoral and local plans and initiatives.
- Promoting consensus building and multi-stakeholder negotiation of key issues and options.
- Fostering public understanding, political will and sectoral commitments to implement the necessary changes.

In its brief history, Projet has engaged in a number of initiatives which include: an analysis of the issues and options for reducing inter-jurisdictional overlap and duplication of regulations; developing a resource information and tool kit to allow groups, communities and organizations to develop their own sustainability strategies and plans; and communication, public awareness and outreach to build the basis for long term change in attitudes and actions - with a focus on youth. Funding for Projet is provided by a number of government and non-governmental stakeholders.

7.5.6 Conservation Authorities

The province of Ontario created a framework for the establishment of Conservation Authorities in 1946 with the passage of the *Conservation Authorities Act*. The three fundamental concepts for establishing this innovative approach to conservation and resource management embodied in the Act are:

- Local initiative of the municipalities to contribute financially and become involved in Conservation Authority resource management projects.
- Cost-sharing between the Province and member municipalities for Conservation Authority projects.
- The use of watershed units as the logical basis on which to develop rational, integrated resource management programs.

The 38 Conservation Authorities which have been established since 1946 differ according to their size, resources, and activities in a manner which reflects regional circumstances. They are active in a number of areas which include: erosion control, community education, fish and wildlife management, flood warning, forestry management, municipal land-use plan review, natural area preservation, Great Lakes shoreline management, water quality monitoring, urban storm water management and waterfront development. Conservation Authorities are funded by the province, participating municipalities, and from revenues generated through ticket sales to public education facilities they operate. The Conservation Authorities are based upon watershed boundaries (the lines roughly separating different drainage basins), however some, like the Metropolitan Toronto and Region Conservation Authority (MTRCA) represent two or more distinct watersheds.

Conservation Authorities are operated by Boards whose membership is largely drawn from elected municipal councillors within the watershed. This structure allows Authorities to plan and implement projects which cross over traditional political boundaries, a critical capability in ensuring effective water resources management. In 1992, the Credit Valley Conservation Authority, in co-operation with the provincial Ministry of the Environment and Energy, the Ministry of Natural Resources and staff from member municipalities, completed phase II of the *Credit River Water Management Strategy*. It is a long term plan for the management of environmental resources in the Credit River watershed. Phase I, which was completed in 1990, concentrated on issues relating to water quality. Phase II represents a practical, comprehensive, and environmentally sound management strategy which will lead to the development of detailed sub watershed plans. A sub watershed is simply a smaller area of a watershed, such as the area draining into a tributary of the watershed's main river. The watershed and sub watershed plans will inform decisions made in the official land-use plans of the member municipalities. Phase II contains specific recommendations to mitigate the impact of future urbanization in the watershed, which is projected to increase from 15 per cent of the land area in 1992 to 35 to 40 per cent by 2011.

The Metropolitan Toronto and Region Conservation Authority recently won an international planning award from the International Society of City and Regional Planners, for its *Don River Watershed Regeneration Plan: Forty Steps to a New Don*. The plan was developed over 18 months by a multi-stakeholder Task Force comprised of citizens and elected officials from 10 local and three regional governments, authority staff, provincial government departments and consultants. An extensive public consultation process was also undertaken in communities throughout the watershed. These efforts resulted in detailed regeneration site plans in each of the sub watersheds and a wide range of other innovative measures to regenerate one

of Canada's most intensively urbanized watersheds. A new multi-stakeholder Don Watershed Regeneration Council is being established to implement the recommendations, many of which will involve a high level of direct community involvement. It is hoped that through the process of community education and empowerment about how their activities positively and negatively affect the health of the Don River watershed ecosystem, communities will begin to build a strong sense of stewardship which will translate into greater support of policies that promote urban sustainability.

"We cannot separate sustainable urban development from sustainable national development from sustainable global development. Sustainability is really a new paradigm which is going to have a fundamental impact upon the lives of people in Canada and internationally. While Canada has undoubtedly made great strides in the area of conservation, many of the fundamentals required are not yet in place. Some of these may be up to 20 years away and will undoubtedly require growing levels of international co-operation and commitment."

Peter Padbury, Canadian Council for International Co-operation, 1994.

CONCLUSION

Canadians face a number of highly complex and interrelated challenges to establishing ecological cities, many of which we share in common with other developed nations. Current trends in transportation, energy and water consumption and land-use demonstrate that the ecological impact of Canada's major urban regions continues to intensify. Increasing levels of air and water pollution, rising dependence on non-renewable energy sources, declining amounts of agricultural and natural lands for food security and biodiversity, water shortages and general social and economic malaise are all symptoms of unsustainable development that promise to become worse over the short term. If current unsustainable trends in urban development continue over the long term, they will eventually lead to a fundamental, and possibly irreversible, decline in the overall quality of life for urban Canadians. In order to reverse current trends, urban dwellers in Canada must be made more aware of the linkages between their day-to-day activities and the local, regional and global ecosystems. Individuals must be provided with affordable and convenient opportunities for change. Finally, government leadership is also required in a number of essential areas to further promote urban sustainability.

Government and numerous non-governmental organizations have already been made significant progress toward laying the groundwork for urban sustainability. Their efforts far outnumber the initiatives, programs, policies and strategies briefly described within the Overview. Municipal governments from across Canada have also begun to act on issues pertaining to urban sustainability through a wide variety of programs and policies. Inter-departmental committees on the environment, water and energy conservation measures, ecosystem-based planning, affordable housing initiatives, and public education through State-of-Environment Reports are all key developments which demonstrate that progress is being made. As these initiatives become more widespread, municipal governments and communities stand to gain considerably from the economic, environmental and social benefits that will be derived from progress toward urban sustainability.

There is a need to accurately identify the nature of values and beliefs which stand as barriers to implementing economically and environmentally beneficial policies in the areas of water resource management, waste reduction and urban intensification and to identify comprehensive strategies which begin the process of changing these beliefs. Conversely, those values and beliefs in support of sustainability should be identified and promoted. The increasing utilization and refinement of municipal, provincial and federal State-of-Environment Reports in Canada are a positive trend in this regard.

Local Round Tables, healthy community groups and other organizations promise to play key, ongoing roles in focusing local community and political attention on the need to make progress towards urban sustainability. The increasing trend of communities across Canada to address the challenge of urban sustainability through multi-stakeholder, local planning initiatives and direct action is a promising sign. However, the true test of strategic planning exercises is their ability to rally the required political and social will and resources to implement recommendations. Municipal leadership will continue to be a vital component in the future success of these initiatives. Application of the generic guidelines for consensus based decision-making described in Section 5 may prove invaluable to strategic planning groups when it comes to implementation.

Developing urban sustainability requires constant effort on the part of individuals, all orders of government, the private sector and non-governmental organizations. In order to make significant progress, new methods of promoting institutional co-operation and integration will be required and existing integrating mechanisms strengthened and built upon. Individual communities and urban regions will continue to require support in order to develop solutions which reflect their particular traditions, as well as existing and future needs. Off-the-shelf solutions to the

complex and interrelated challenges of urban sustainability are unlikely to adequately address the different social, economic and environmental circumstances within Canada's urban regions. However, a greater level of understanding of the impact of current patterns of urban development on sustainability may be obtained through networks for information sharing about success stories within Canadian urban regions and the international community.

The Overview has included descriptions of innovative policy tools which may be utilized by individuals and organizations in their ongoing efforts to promote urban sustainability in Canada and abroad. There remains, however, a definite need to work toward the implementation and refinement of a number of the innovative policy tools and strategies set out in Section 5. Specifically, the application of the Ecological Footprint/Appropriated Carrying Capacity (EF/ACC) concept should be applied to test cases across a wide range of municipal applications in order to further evaluate how this tool may be utilized to increase measures in support of urban sustainability. For example, EF/ACC could be used to evaluate the relative ecological impact of different land-use policies under consideration within a municipal Official Plan, thereby providing elected representatives with information which integrates sustainability into the decision-making process.

Many of the fundamental or root challenges to sustainability cannot be adequately addressed, however, by Canada's municipal governments alone. The identification of the exact nature and scope of provincial and federal taxation and expenditures which act as disincentives to promoting urban sustainability could assist municipal governments in developing and implementing measures to promote, for example, increased use of public transit. The impact of municipal taxation and revenue generation on urban sustainability, particularly in the areas of land-use planning and development, should be evaluated. Opportunities for substantial resource savings in the areas of water conservation and energy efficiency promise to provide strong incentives for additional progress in these areas.

Provincially, the legislative framework for local governance institutions should be assessed in order to maximize the ability of municipal institutions to respond to the interrelated social, economic and ecological dimensions of sustainability and to reduce costs. Such an exercise would help focus attention on the important role of institutional frameworks in promoting or hindering sustainability, as well as assisting in the future refinement of concepts for evaluating and developing sustainable forms of governance. Provincial governments should evaluate their bureaucratic structures with a view to improving the institutional framework in a manner which reflects the integrated nature of sustainability. Federally, this challenge may be undertaken by the soon to be established Commissioner for Sustainable Development. Application

of the draft State-of-Institutions Reporting framework outlined in Section 5 could be used as a starting point for these efforts. An examination of the type of structures that allow for increased focus upon the development of urban sustainability is required.

The ecological cities concept challenges all Canadians to increase their efforts in support of developing urban sustainability - in their work and leisure. Just as delaying measures to curb Canada's growing debt only further erodes the capacity of governments to deliver services, the avoidance of tough measures which strike at the roots of the challenges facing urban sustainability make it only more and more difficult for future urban dwellers to live in healthy and sustainable communities. While most current trends in Canada point away from urban sustainability, efforts to promote the establishment of healthy and sustainable communities have increased substantially in recent years, and will continue to grow, in large part in response to the many negative results which stemming from unsustainable development. These efforts remain critical in building the values, knowledge, and skills required to begin the difficult process of addressing the fundamental challenges to making lasting progress toward ecological cities.

APPENDIX I

METHODOLOGY, PARTICIPANTS AND INTERVIEW QUESTIONS FOR DEVELOPING THE OVERVIEW

A workshop was held in Winnipeg, Manitoba in June 1994 with participants from municipalities across Canada to discuss specific issues relating to the establishment of ecological cities.

Over twenty-five key participants from various organizations were interviewed, in person or by phone, to solicit their input on the challenges and opportunities facing Canadians in establishing ecological cities. From this group, several participants were asked to review and comment on the draft document.

Appendix I is a list of Workshop participants, interview participants and the questions posed in each interview.

Ecological Cities Workshop

Lonny Holland, Alderman, City of Halifax, Nova Scotia

Randy Strolioff, Energy Coordinator, City of Regina, Saskatchewan

Bob Bowes, Mayor, City of Surrey, British Columbia

Doug Lychak, Chief Administrative Officer, City of Surrey, British Columbia

Mike Facey, Director, Intergovernmental Affairs, City of Calgary, Alberta

Roger Mareschal, Councillor, City of Aylmer, Quebec

Peter Spurr, Senior Officer, International Relations Division, Canada Mortgage and Housing Corporation

Michael Roche, Director, Policy and Programs, Federation of Canadian Municipalities

Brock Carlton, Deputy Director, Chinese Cities Project, Federation of Canadian Municipalities

Charlene Lambert, Senior Policy Analyst, Federation of Canadian Municipalities

Interview Participants

David Bennett, Director, Health, Safety and Environment, Canadian Labour Congress

Phil Ferguson, Executive Director, Canadian Urban Institute

Bill C. Campbell, Senior Planner, City of Halifax, Nova Scotia

Richard Dion, President, Pluram International

Pat Mackenzie, Alderman, City of Edmonton, Alberta

Anna Hercz, Senior Policy Analyst, City of Ottawa, Ontario

Ken Cameron, Manager, Greater Vancouver Regional District, British Columbia

Cameron Drouin, Senior Analyst, Federal Environmental Assessment Review Office

David Neufeld, Environmental Co-ordinator, Ontario Ministry of Housing

Mark Bekkering, Senior Policy Analyst, Regional Municipality of Hamilton-Wentworth, Ontario

Rozlynne Mitchell, Chair, Sustainable Communities Task Force, British Columbia Round Table on the Environment and the Economy

Dave Reynolds, Environmental Coordinator, Municipality of Calgary, Alberta

Jerry Beausoleil and Lawrence Sinclair, Department of Finance

Garth Bangay, Director General, Ecosystem Conservation, Environment Canada

Breda Nicolas, Senior Program Co-ordinator, Green Communities Program, Ontario Ministry of Environment and Energy

David Crombie, Commissioner, Waterfront Regeneration Trust

Carl Hrenchuk and Sheldon McLeod, Canadian Council of Ministers of the Environment

Ron Nielson, Policy Coordinator; Ken Olgilvie, Executive Coordinator; Patrice Côté, News Editor; Elaine Hardy, Graduate Assistant; Cathy deRubeis, Graduate Assistant, Ontario Round Table on the Environment and the Economy

David Marshall, Program Director, Fraser Basin Management Board

Bill Ashton, Director, Research, Rural and Small Town Program, Mount Allison University

Wayne Bond, Urban Ecozone Coordinator, State of the Environment Directorate, Environment Canada

Chris Fillingham, Chair, Joint Construction Council, Urban Development Institute; Principal, Dunlop Farrow Architects

Ray Tomalty, Ph.D., Student, University of Waterloo

Mark Roseland, School of Resource Management and Environmental Management, Simon Fraser University

Mathis Wackernagel, University of British Columbia Centre for Human Settlements, Task Force on Healthy and Sustainable Communities

Bill Granger, Chair, Metropolitan Toronto and Region Conservation Authority

Peter Padbury, Coordinator, Sustainability Program, Canadian Council for International Cooperation

Richard Gilbert, Consultant

Development and Preparation of Document: Overview

Peter Spurr, Senior Officer, International Relations Division, Canada Mortgage and Housing Corporation

Michael Roche, Director, Policy and Programs, Federation of Canadian Municipalities

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Charlene Lambert, Senior Policy Analyst, Federation of Canadian Municipalities

Kathy Thompson, Senior Policy Analyst, Federation of Canadian Municipalities

Sylvie Delaquis, Policy Assistant, Federation of Canadian Municipalities

Barbara Martin, Thompson Gow and Associates

Carlo Mastrangelo, Thompson Gow and Associates

Trent Gow, Thompson Gow and Associates

The views expressed in the Overview do not necessarily reflect those of all the participants, or the organizations they represent, unless otherwise stated.

Interview Questions

1. What in your view, are the most serious environmental issues, in the broadest sense of the term, currently challenging Canadian cities?
2. What do you perceive to be the fundamental obstacle(s) to achieving the long term goal of an ecological city, defined as a settlement which does not undermine the natural capital (air, land, water and renewable resources) of the local, regional and global environments and why?
3. How would you suggest that these obstacle(s) be overcome?
4. Do you know of any case studies of Canada's successes in achieving sustainable urban development - innovative policies, strategies, or practices that you think would be of interest to other OECD member countries and why?
5. Institutional gridlock is often cited as a barrier to sustainable urban development in international literature. Are you aware of any examples of innovative policies and programs that specifically promote a more integrative approach to sustainable urban development?

6. What measures, if any, should be taken at the federal order of government to improve the capacity of urban areas to become more sustainable? By the provinces?
7. If institutional reorganization is required to achieve sustainable development, what form might this take and why?
8. What role do you see for the private sector and non-government organizations?
9. How important is public participation in the process of making Canadian cities fully sustainable and why? Does the public participate enough or too much in the decision making processes of governments?
10. What are the principal social factors or conditions which affect a city's ability to make progress toward sustainability?
11. How might the current system of financial transfers between the federal government, the provinces and local governments be modified to improve local environmental performance?
12. What are the major global or national trends, if any, which exert an influence on a city's ability to pursue sustainable development?
13. What future role might educational and research institutions play in promoting public education for sustainable development?
14. Can you recommend any other contacts or documents that would assist in the development of Canada's Overview?

Detailed Questions

1. How important is the ecosystems approach to municipal management (as outlined, for example, by International Council for Local Environmental Initiatives - a method of management that treats human communities as ecosystems in their own right)?
2. How important is it that we measure our progress or lack thereof to sustainable urban development? Are local State of Environment Reports sufficient or do we need a more detailed measure of a city's progress toward sustainability?

3. Does there need to be a set of national/municipal standards or indicators that can be used to measure sustainable urban development?
4. Is there a role for the environmental impact assessment process to play in helping cities to achieve sustainable development?
5. What are the effects of the current taxation structure on sustainable development, particularly at the local government level?
6. Do you see a role for consensus decision-making as a tool to helping achieve sustainable urban development in Canada?

APPENDIX II

CONTACT LIST FOR CANADIAN ROUND TABLES AND THE HEALTHY COMMUNITIES NETWORK

NATIONAL AND PROVINCIAL ROUND TABLES

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<p>Manitoba Round Table on Environment & Economy Sustainable Development Coordination Unit 305-155 Carlton St. Winnipeg, Manitoba R3C 3H8 Bob Sopuck Executive Director Ph: (204) 945-1124 Fax: (204) 945-0090</p>	<p>Ontario Round Table on the Environment & Economy 1 Dundas St. W., Suite 2502, P.O. Box 4 Toronto, Ontario M5G 1Z3 Ken Ogilvie Executive Director Ph: (416) 327-2032</p>	<p>New Brunswick Round Table on Environment & Economy Department of the Environment P.O. Box 6000 Fredericton, New Brunswick E3B 5H1 David Besner Executive Secretary Ph: (506) 453-3703 Fax: (506) 453-2265</p>
<p>Nova Scotia Round Table on the Environment & the Economy 5151 Terminal Road P.O. Box 2107 Halifax, Nova Scotia B3J 3B7 Dr. Chang Lin Ph: (902) 424-6346 Ph: (902) 424-5300 Fax: (902) 424-0503</p>	<p>P.E.I. Round Table on the Environment & the Economy c/o Department of Environmental Resources P.O. Box 2000 Charlottetown, P.E.I. CIA 7N8 Andre Lavoie Ph: (902) 368-5032</p>	<p>Northwest Territories Round Table on the Environment & the Economy Department of Renewables Resources Government of the Northwest Territories P.O. Box 1320 Yellowknife, N.W.T. X1A 2L9 Ph: (403) 920-8768 Fax: (403) 873-0114</p>
<p>Saskatchewan Round Table of Environment & Economy Strategic Planning Branch Saskatchewan Environment & Public Safety Walter Scott Building 3085 Albert St. Room 218 Regina, Saskatchewan S4S 0B1 Ph: (306) 787-1348 Fax: (306) 787-0197</p>	<p>Table ronde quebecoise sur l'environnement et l'economie Secretariat a la ronde quebecoise sur l'environnement et l'economie 3900, rue de Marly, boite 64 6e etage Sainte-Foy (Quebec) G1X 4E4 Ph: (418) 643-7860 Fax: (418) 643-7812</p>	

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Cowichan Visions Round Table Greg Goodwin Ph: (604) 387-0279	Kispiox/Lakes Land and Resource Management Tan Calhoun Ph: (604) 847-7505	Robson Land and Resource Management Program Gordon Carson Ph: (604) 566-4628	Vanderhoof Land and Resource Management Program Dave Borth Ph: (604) 567-6363
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CANADIAN HEALTHY COMMUNITIES PARTICIPANTS

BRITISH COLUMBIA

Agassiz	Fort Nelson	New Aiyansh	Salmon Arm
Armstrong	Fort St. James	North Vancouver	Sidney
Ashcroft	Fort St. John	Oliver	Smithers
Atlin	Gitwinksihlkw	Osoyoos	Sooke
Bowen Island	Gold River	Parksville	Sparwood
Burnaby	Granisle	Parson	Squamish
Burns Lake	Hagensborg	Peachland	Stewart
Campbell River	Hazelton	Pemberton	Summerland
Castlegar	Hope	Pitt Meadows	Surrey
Chase	Houston	Port Alberni	Tsawassen
Chemainus	Hudson's Hope	Port Clements	Terrace
Chilliwack	Kamloops	Port Hardy	Tumbler Ridge
Clearbrook	Keremeos	Port Moody	Valemount
Clearwater	Kimberley	Port Renfrew	Vancouver
Coquitlam	Kitimat	Pouce Coupe	Vanderhoof
Courtenay	Ladysmith	Powell River	Vernon
Cranbrook	Lillooett	Prince George	Waglisla
Dawson Creek	Mackenzie	Prince Rupert	Victoria
Delta	Maple Ridge	Princeton	Whistler
Dog Creek	McBride	Quathiaski Cove	White Rock
Duncan	Merritt	Quesnel	Williams Lake
Elkford	Mission	Revelstoke	
Fernie	Nanaimo	Richmond	

MANITOBA

Brandon
Churchill
Cranberry Portage
Gillam
Gimli
Leaf Rapids
Portage La Prairie
Snow Lake
Souris
The Pas
Thompson

NOVA SCOTIA

Dartmouth
Lunenburg
Parrsborough

NEW BRUNSWICK

Bathurst
Campbellton
Chipman
Fredericton
Moncton
Sackville
Saint John

ONTARIO

* in the process of
being updated

QUEBEC

Ascot
Baie Comeau
Beauceville
Beaumont
Beauport
Bois-des-Fillions
Breakeyville
Cabano
Chateuguay

Contrecoeur
Degelis
Dolbeau
Dorion
Fermont
Gallix

Gatineau

Girardville
Granby
Grande Entree
Grand Vallee
Grantham
Grenville

Hull
Jonquiere
Kirkland
Lac Etchemin
Lachine
La Dore
L'Ancienne-Lorette
L'Annonciation
La Salle

Longueuil
Louiseville
Massueville
Matane
Montebello
Montmagny

Montreal

Natashquan
New-Richmond
Pierrefonds
Pintendre
Pointe-Claire
Port-Cartier

Quebec
Rimouski
Riviere-du-Loup
Rosemere
Rouyn-Noranda
Roxboro
Salaberry-de-Valleyfield
Scotstown
Sept-Iles

Sherbrooke
Sillery
Sorel
St-Anicet
Ste-Anne-de-Portneuf
St-Antoine-de-l'Isle-aux-
Grues
Ste-Catharine-de-la-
Jacques-Cartier
St-Charles-de-Drummond
St-Fabien-de-Panet
Ste-Genevieve
St-Hubert
St-Hyacinthe
St-Jean-Port-Joli

St-Jean-sur-Richelieu
St-Joseph-de-Sorel
St-Moise
St-Pacome
St-Pascal-Ville
St-Pascal-Paroisse
Ste-Petronille
St-Raymond de Portneuf-Ville
St-Raymond de Portneuf-
Paroisse
St-Roch-des-Aulnaies
St-Roumuald
St-Vallier
Tadoussac
Terrebonne
Vaudreuil

Verdun

Westmount

APPENDIX III

SOURCES OF FURTHER INFORMATION AND ASSISTANCE

General Assistance/Information

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APPENDIX IV

LISTING OF ACRONYMS

AES	Architectural and Engineering Design Services
BCRTEE	British Columbia Round Table on the Environment and Economy
CMHC	Canada Mortgage & Housing Corporation
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
CEN	Canadian Environmental Network
CHCN	Canadian Healthy Communities Network
CIDA	Canadian International Development Agency
CRTC	Canadian Radio-television and Telecommunications Commission
CURE	Canadian Urban Research on the Environment
CMA	Census Metropolitan Areas
CMIT	Committee of Ministers on Internal Trade
EF/ACC	Ecological Footprint/Appropriated Carry Capacity
EARP	Environmental Assessment Review Process
ENGO	Environmental Non-governmental Organization
FEARO	Federal Environmental Assessment and Review Office
FCM	Federation of Canadian Municipalities
FRAP	Fraser River Action Plan
GLWQA	Great Lakes Water Quality Agreement
GTA	Greater Toronto Area
GVRD	Greater Vancouver Regional District
GDP	Gross Domestic Product
ICURR	Inter-governmental Committee on Urban and Regional Research
ICLEI	International Council for Local Environmental Initiatives
IDRC	International Development Research Centre

IJC	International Joint Commission
IISD	International Institute of Sustainable Development
MTRCA	Metropolitan Toronto and Region Conservation Authority
NAISC	National Air Issues Steering Committee
NRC	National Research Council
NRCan	Natural Resources Canada
NRTEE	National Round Table on the Environment and Economy
NSDS	National Sustainable Development Strategy
NIMBY	Not in My Backyard
ORTEE	Ontario Round Table on the Environment and Economy
OECD	Organization for Economic Co-operation and Development
RAP	Remedial Action Plan
SOER	State of Environment Reporting
UBC	University of British Columbia

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